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ABSTRACT

The issues considered at this conference cluster about--(1) the relationship of the architect to educational objectives and the translation of these aims into building design, (2) facilities financing and federal aid, and (3) college housing. Reviews and critiques of recently constructed facilities, namely the University of Illinois at Chicago, Miami-Dade Junior College, Scarborough College, Ontario, and Simon Fraser University, British Columbia, are included. (FPO)

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1966 Proceedings

"ARCHITECTURE AND THE COLLEGE"

THE SECOND IN A SERIES OF NORTH AMERICAN CONFERENCES TO CONSIDER THE CRITICAL ISSUES IN CAMPUS PLANNING AND COLLEGE BUILDING DESIGN.

APRIL 17 THROUGH APRIL 21

CONDUCTED BY
THE DEPARTMENT OF ARCHITECTURE
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS

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PROCEEDINGS

ARCHITECTURE AND THE COLLEGE

April 17, 18, 19, 20, 21, 1966

DEPARTMENT OF ARCHITECTURE - UNIVERSITY OF ILLINOIS - URBANA

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THE ARCHITECT AND COLLEGE AND UNIVERSITY OBJECTIVES

Edward L. Katzenbach

I note that you as the audience of architects and I as the speaker and an educator, have a good deal in common. I suppose the two professions which everybody knows more about than the people who practice them are architecture and education. I am terribly sorry for you--architects in education. It must be almost tragically difficult. I know that I have been feeling very strongly about college architecture, particularly in my native institution, and I have been wanting to write somebody a letter for a long time. I think it is about time that, at the very least, they got the chemistry building away from the schoolboy-Gothic, or else changed the course names to Alchemy I and Alchemy II.

The reason why we are together this morning is because those who are interested in architecture on the campus have a particularly difficult job to do. In a sense, you are architects of tradition, and in a sense you are trying to do something that is new and different, and this is the essence of your problem. You are trying to get the educational community to say enough about itself and its plans, its aspirations, and its ideas, so that you can turn these into some kind of structure.

After having examined a great many planning documents, again, I must say that you have my sympathy because educational institutions do not articulate their needs and ideas very well except in terms of numbers of students and amounts of projected moneys. They certainly do not project planning documents in terms of what they will be teaching or how they will be teaching. Therefore, what I want to do this morning is to consider the major problems in the changing patterns of higher education which may have an immediate effect on you and your thinking about the university.

I want to talk to you first about the size and dimensions of modern man. Second, I want to talk about consortia and systems--consortia being voluntary agreements among colleges and universities, and systems being involuntary. Third, I want to relate computers and some concepts of comparability and the meaning of these for architects, particularly in the area of student environments. Fourth, I want to say something about program budgeting as a way to get away from the threat of a certain bleakness of sameness on college campuses. Finally, I want to say a word about new needs for innovation.

What seems to have happened to mankind over the last 150 years? The point that never gets into the history books is the fact that man is something more than a spiritual or political creature. He is something more than a social mammal. He is an enormously big, powerful, perceptive person. Technology has made him this way.

In the middle of the nineteenth century, or perhaps before that--at the end of the eighteenth--man suddenly became able to make his muscular powers grow. That is to say, he suddenly became powerful in the sense that he could literally move mountains, make roads, and dig ditches. He became wonderfully dexterous. He could weave cloths, print paper, spin yarns. He became fast. By the beginning of the twentieth century, he could travel some sixty times faster than ever before, and since that time, he has been able to travel - at what? a million times faster? The muscular framework of man has increased.

But more than that, in the first half of the twentieth century, man's ability to communicate generally suddenly multiplied. All of his powers of perception (except one) increased immeasurably. Man was able to speak quite literally from any place on earth to any person any place else on earth. He was able to talk in space and under oceans. He could hear in a way obviously that he could never hear before. He could see in a way he had never seen before--with radar and with television. The arts of communication of this remarkable being put him in contact with mankind everywhere. The only thing, I suppose, that did not develop, so far as the senses are concerned, is that of his nose and that is probably just as well.

Now, in the second half of the twentieth century, we are faced with an explosion of man's capacity to understand. This is based largely, I suppose, on the computer. Man can take in more information than ever before and handle it intellectually in a manageable compass. He can remember things and recall information instantly in a way in which no mind, or collection of minds, has ever been able to do before, and he can calculate quite literally with the speed of light.

This, then, is the kind of person that we have on our college campus today--a man who is a spiritual being, a political being and a social being, burdened with all the problems this implies. We have, in this being, a technological superman as well. This, it seems to me, has tremendous implications for higher education, if we think of man in these kinds of terms.

The span of his productive lifetime, in spite of the increase in his life's span, is growing increasingly shorter. The amount of time that he has to spend in conferences like this or in some other learning situation, is becoming longer and longer; therefore, the chance to get on with his own work is becoming shorter and shorter. His paycheck is related not only to what he produces, but as much to what he learns. One of man's greatest tasks, therefore, is self-regeneration.

What does this mean? It seems to me that we will be re-evaluating a very large part of our undergraduate curricula and our attitudes towards undergraduate education. The same is probably true, I would assume, that undergraduate education would become less professionalized, rather than more so, because people will realize that the education a man has to go through in a lifetime must really continue--that it has to have a broad base on which to build. If it is true that there will be less specialization on the undergraduate level, perhaps the whole idea of a college housing center as a learning center will be increased. Structure will change with curricula offerings on the undergraduate level.

Is the mode of learning which is presently still classical on a college campus quite adequate for modern needs? Increasingly, as I go around to business establishments, I find that program learning is used in a way in which it certainly is not on a college campus. Teaching devices are now being used on business campuses which are not present as yet on college campuses. It seems that these new modes and methods of education are, in a very real sense, here to stay; and the college campus has not quite realized it yet. In many respects, business may be a great innovator in campus teaching a decade from now.

Also, I think that there is another whole area in which college campuses today have not done as much thinking as they should. Business is spending some $15 billion a year on education and training--much of it on the advanced level. Sperry Rand, for example, has set up a post-graduate school system in physics, mathematics, and chemisty, simply because their needs could not be met on the college campus. The General Motors Corporation, as you know, gives degrees. Litton Industries has a staff of educational specialists that numbers in the hundreds. International Business Machines spends about $42 million on education and training--most of it in education. This sum, alone, is equal to half of that spent by the Congress on public education in all of Washington, D.C. These are big sums of money, and they are important sums of money.

A study of this phenomenon over a period of time has indicated to me that there is no question or doubt that there is not the kind of communication going on between the college on the one hand, and business, industry, technology, the government laboratories, and private laboratories, on the other hand, that there should be. Colleges and universities have not, as yet, found out how they fit into a lifetime of learning. They don't know how they should articulate their own programs vis-à-vis those that are going on in business and industry. So, again, this is a question which we want to ask--are colleges and universities going to be centers of adult learning and something that business and industry is going to use, or is industry going to continue to do what it is doing now--not going to the colleges and universities because the colleges and universities are not giving them what they want? Is this a trend which is going to continue in terms of college campus planning?

So much then, at the moment, for the man we are educating and his problems, his problems as he gets out into the world, and his problems with respect to his home campus, and its problems with respect to him.

Now, let me say a few words about my second point. Increasingly, state legislatures everywhere have been disturbed by the fact that individual colleges and universities ask for money separately, and are, in fact, autonomous. Legislatures have not been able to compare expenses in one to expenses in another, except in those two crude terms of control--the teacher-pupil ratio and the per-pupil cost. Increasingly, public institutions are being put together in systems, and the controls are more stringent at the top. Only a few years ago, for example, a fine system of higher education in Ohio was put together under a distinguished Chancellor, John Millett. Being a very bright administrator, he is beginning to pull that system together in terms of finance, in terms of many kinds of costs which were the individual university's business in the past. The same thing is going on in New York State. I happened to run across an item in the paper yesterday noting that in Kansas no college in the public sector will be allowed to go ahead with a graduate program, unless it is approved by consultants from the American Council of Graduate Schools. In other words, control is going to be tighter at the top.

Even in the private sector, I would suggest that college and university consortia will become much more the wave in the future. Already, small clusters of colleges and universities are swapping courses, so that all are able to do together what none can do as well separately. Increasingly, colleges and universities are going to interchange professors. Eventually, there will be a single admissions office for a number of institutions. Records are going to be centralized in ways that they have not been in the past. There will come, I believe, other kinds of cooperation. This does not mean that institutions won't find a niche individually for themselves, perhaps in a way in which they haven't heretofore. This, I think, is important for the architects--to find out what it is that the future university image is; what it wants to do best in the system.

There is, however, a possibility of real bleakness in American education because once comparative data are available, there is a tendency on the part of less bright administrators to make everything comparable. Nothing could be more deadening on the scene of higher education. On the other hand, though, because of the fact that we have these new systems and new consortia, comparable data are more possible to obtain. Indeed, nothing can be more valuable to the administrator.

Now we come to my third topic: the computer--the transducer of comparable data. We are doing a study at the present time on the use of computers on the college and university campus, together with the System Development Corporation and the College Entrance Examination Board. What we are finding is that, although there are obviously huge numbers of computers on college campuses today, they are not being used as imaginatively as they could be. The computer is, after all, a challenge to man's mind. It is something that ought to make him think about what information he wants. Higher education is going to be able to obtain data to give us some idea about the impact of environment on students--on the relationship between what his expectations were when he was admitted to the institution and the fulfillment of those expectations by the academic community which he entered. We are also going to be able to tell some things, again in the very near future, about the results of all our experiments with teaching which no one can tell you very much about now. We don't have the comparative data we really need, but it seems to me that we could get comparative data in terms of results from teaching. This would have an impact too on larger classes, as well as on smaller classes, and on various methods of teaching. We are going to learn a great deal more about the needs of graduates of an institution than we have ever before. We are going to be able to compare institutions in all these terms; we are going to be able to compare them within state systems; we are going to be able to compare them nationally. For the first time, we are going to get some real data on environments, and after all, environment is very much your business. This, therefore, should be a particular interest of yours in the future.

Fourth, I think we are going to see across the country a new system of budgeting--one that has been called program budgeting. It has actually been in existence since the Hoover administration in the 1930's, but suddenly it is becoming fashionable. It is going to have an enormous impact on the way in which colleges and universities think of themselves. I imagine architects already know about it, but I would like to make sure they do by saying a little about it, in particular, stressing how rapidly the concept has spread.

As used today by the government and increasingly by states, program budgeting was first conceived of by the RAND Corporation for the Department of the Air Force. When one of the inventors of program budgeting, Dr. Charles Hitch, became Controller of the Defense Department, he instituted the system there. From the Defense Department, it has spread across government. The President has insisted that all departments and agencies of government use program budgeting and use some kind of five-year projection. In other words, he has a control. The budget can be changed, to be sure, but it is at least three years ahead and has projections up to five years.

I notice now that the whole concept of program budgeting is spreading to college campuses. It is significant, for example, that Dr. Hitch himself is now the Vice President for Budget and Finance for the University of California system. I like to think that a publication of the American Council on Education, Planning for Effective Resource Allocation in Universities, by Dr. Harry Williams (on loan from the Institute of Defense Analyses) will increase understanding.

Now, let me say a word or two about what program budgeting will do to you and might even do for you. At the present time, the way a university budget in most colleges and universities is laid out is in a series of categories--usually faculty salaries, student services, operations and maintenance, and sometimes amortization and one or two other items. The point is that it is a vertical budget. Now, I think that in the future we are going to see increasingly horizontal budgets, such as budgets for students, for example, put together in units, so that the elements of the budget are visible and the objectives clear. How much money admissions is costing versus how much money alumni is costing versus how much money counseling is costing will be made visible elements in a budget, among which alternative ways of spending a dollar may be decided.

What program budgeting is doing, in essence, is trying to maximize the number of alternatives that one has by increasing the number of objectives to be costed.

Perhaps it might be useful to you to suggest to colleges and universities that future expenditures of money must be much more fully correlated with program objectives than they have been before. One of the ways in which you may get people to articulate ideas, which I said at the beginning seems to be your greatest problem, is to get them to talk about objectives and money together. This, at least, forces a university authority to tell you what he would do with such-and-such versus what he would do with another. Then, this may lead him to say why he is doing and what he is doing and why he wants to do what he wants to do. Until you have this information, you can hardly satisfy the client.

The university is a very diverse place with diverse interests, but perhaps program budgeting is a way in which one can maximize the individuality of an institution or the individuality of its various parts by highlighting priorities, by putting out planning documents which do relates objectives to money and people.

In other words, it seems to me that program budgeting is going to give higher education an opportunity to innovate in its thinking in a way that perhaps it has not in the past. I think that, in the future, colleges and universities are going to have what a friend of mine calls "talking papers."

There is, I think, another way of meeting this objective. Recently, there has been much research on innovation. Launor Carter, Executive Vice President of the System Development Corporation, wrote a good review of it recently in a paper called Research Development and Use, a kind of banal title, if I may say so, for a fine paper. He said that the way in which innovation establishes itself within the area of research and development is not through research papers. Research papers are left on the shelf; a new idea is something that gets spread about only because one is enthusiastic and talks about it. Innovators are people and innovation is through people who stay with the same idea over a period of time, and who sell other leaders on it--this is the way innovation takes place.

I would suggest that one of the problems in higher education is that there is no place on the college campus today where people can talk to one another in such a way that the innovator can get across his point. The admissions officer does not talk to the alumni office; the faculty does not talk to student guidance personnel; the budget directors talk only to the president. Faculties talk about curricula, but in a vacuum because they are not thinking about budgets at the same time. Now it seems to me that if I had the privilege of being a college architect and as interested in buildings and in campus planning as I am, one of the things that I would most strongly advocate is insistence on having a series of problem-oriented seminars on that campus to get faculty together with administration--to get money together with ideas. It seems to me that this kind of ongoing seminar, meeting on a weekly basis on a well-structured agenda, would accomplish marvels for the institution and would give you insights--insights you could never get otherwise as to what the institution thinks of itself and its future. Insist on broad representation.

Let me say in conclusion that because of the nature of the new man, because of his strength, because of his ability, because of the length of time it takes to train him, because of the new organizational patterns which we are seeing in higher education, because we have new tools of analysis and new tools of control, because we can learn things about our environment that we have never learned before, because we can force alternatives to the fore in a way in which we never have been able to before and because we can talk about the nature of higher education in a way in which we haven't before, we are on the verge of some very new things in higher education. Higher education is going to make changes in the next ten years more dramatic than breaking up the old classical education.

As a matter of fact, I think that you can already see this--in that portion of higher education which is liveliest and which knows its objectives best--and that is in the area of the junior college. I notice that you are talking about Miami-Dade this afternoon, a college I know well; but if you take a look at Flint or San Mateo or, again, in terms of new ideas, the Air Force Academy or Simon Fraser in British Columbia, you can see a conjunction between new ideas and better architecture, between new ideas and bricks and mortar, between ideas and structural creativity.

An architect obviously is an interpreter of society. An architect is a man who grasps society's emotions, its ideals, its thoughts, its ideas, its theology, using that word very broadly. It seems to me an architect or an architectural planner must be a generator of ideas as well. By asking the right questions, you will get better answers. New ideas will, I know, lead to a new era in college architecture. But just as you have to get to know me to build my house the way I really want it, rather than the way I think I want it, so too, you have to know what is going on in higher education, so that you can ask questions about it, so that you can interpret the college and university to itself.

FEDERAL PARTICIPATION IN PLANNING AND FINANCING THE FACILITIES FOR HIGHER EDUCATION

Jay du Von

At first glance, my qualifications for addressing a group of distinguished architects are decidedly skimpy. They consist of a summer's work in the office of the architect in my father's lumber company not far from here in Rock Island, Illinois, which resulted in my earning my Boy Scout merit badge in architecture. Ben Horn was my counselor. On the other hand, through a series of coincidences or perhaps through some grand design which I could not perceive, much of my career has been spent in activities involving construction, the Federal Government and our colleges and universities. Perhaps if I sketch out some of these programs hurriedly, I can fill in the background and we can have the broad perspective in which to consider just what the Federal participation has been in planning and financing facilities for higher education; what it is at the present; and what it will be in the immediate future.

In the years since the war, one of the most important factors in changing not only higher education but the quality of American life was the G.I. Bill of Rights. In a brief span of years, the right to a college education changed from a prerogative of the children of upper middle-class families to an opportunity to be extended to all who had the ability to take advantage of it. The complete fulfillment of this ideal is still to be reached, but much of the involvement of the Federal Government in the years since the war seems to me to stem from this concept. Most of our programs in the Office of Education and even our poverty programs such as "Operation Head Start" and "Operation Upward Bound" begin with this premise as does the new G.I. Bill directed towards the veterans of Viet Nam.

But expansion of education opportunity brings with it an expensive commensurate expansion in facilities, sometime temporary, sometimes permanent. The great influx of veterans into the colleges in the last half of the forties was considered temporary, and the response of the Federal Government was temporary, both in terms of time and the kind of construction which it financed. Under the Veterans Educational Facilities Program, the Office of Education and the Bureau of Community Facilities of the Federal Works Agency cooperated in providing thousands of temporary buildings for classrooms to take care of the G.I. students; most of them were barracks, Quonset huts, trailers, hangars, almost every sort of building from military installations which could be transported and re-erected on a campus. Under the same program, literally billions of dollars worth of every kind of surplus property went to the colleges; sometimes, whole laboratories intact were transferred. It was also during this period that the Housing Agency was moving temporary housing to college campuses, again barracks, Quonset huts and mobile housing. The figure of 169,000 units in these "Vetsvilles" seems to stick in my mind. They called them "Fertility Sites" on some campuses. The colleges and universities will attest that this Federal assistance was essential, that without it they could never have undertaken the burden of enrolling these returning G.I.'s. But, even while we were working feverishly on this task, some of us were aware that we were creating the collegiate slums of the future and remembered the adage that "no building is as permanent as a temporary building." I dare say that we can still find some of them on this beautiful campus; I could a few years ago.

A more permanent response by the Federal Government to a permanent need of higher education came in the early 1950's when the housing needs of the Nation were predominant and the housing needs of higher education were critical. The Depression followed by the War had prevented construction of permanent residence halls in any adequate measure and added to this hiatus was the problem of rising costs, not only the rising costs of construction, but the rising costs of board and room piling up on the backs of students--costs which were already beginning to concern our educational administrators as new limiting factors on educational opportunity. This time, the response of the Federal Government was massive and permanent. In the 14 years beginning in 1951, the Federal Government pumped almost $3 billion in low-interest-rate, long-term loans into residence halls and student union construction under the College Housing Program. Accommodations for almost 800,000 students have been provided, as well as some several hundred student unions and dining halls. Today, every second student living in a college-owned residence hall is living in one financed under that program. The program is authorized for another three years, and I have no doubt it will continue as long as the need exists. It is popular with the Congress for many reasons, one of them being that it is probably the only program of Federal loans which has never experienced a default in the payment of principal or interest. Not the least of its fringe benefits is that it tends to keep down the cost of education in terms of board and room.

As the need for new student housing was being satisfied at a rate which was close to the ability of the colleges and universities to program, construct, and fill new residence halls, the need for Federal assistance in new academic facilities was increasingly apparent and was over and over again proposed to the Congress by the Office of Education and the educational associations. However, the need would have to be partially satisfied by grants as well as loans, and here the Church-State issue is involved. Finally, shortly after the death of President Kennedy, and perhaps in part as a tribute to him and the program which he had so ardently endorsed, the Congress passed the Higher Education Facilities Act of 1963.

In my historical sketch, we are now moving into the fiscal year just past and the present one. Funds were not appropriated for the Academic Facilities Program until September of 1964, and the first applications were not approved until December of that year. However, during the seven months ending last June, we were able with overtime, Saturday and Sunday work to process 525 applications for $110 million in loans. In addition, $60 million in grants for graduate schools were approved. In the meantime, the Congressional grist mill was grinding out new legislation and we found ourselves with a broader program of grants, an interest rate reduction to 3 per cent on loans, and a new program of grants for strengthening undergraduate education through grants for teaching, equipment, and closed-circuit television. The fire bell has rung again and like old fire horses, we are trying to respond to it. This year, we are approving $460 million in grants for academic facilities, $60 million for graduate schools, and $110 million in loans. This $640 million in Federal assistance will be part of close to $2 billion in college construction.

What about next year and the years to follow? Next year, we can see fairly clearly in the shape of the Administration legislation introduced by Congressman Powell on March 1. It provides another $460 million for grants, $60 million for graduate schools, and $200 million in loans, and the possibility of another $100 million in loans if a technique can be authorized under other legislation whereby loans already made can be used as security for borrowing in the market, and thus increase the funds available for program lending. I would like to speak about that a little later. Powell's bill, H.R. 13174, also extends the authorization for the programs through 1971, and this is about as far as we can see into the years to come.

The new legislation, which is known as the Higher Education Amendments of 1966, has two new provisions which I have urged and which I think will be of particular interest to you. Of the $460 million for grants, $4 million can be spent for grants for comprehensive planning to state commissions, combinations of institutions, regional grouping and individual institutions. Some of you here have been urging this kind of approach for years. Many, many institutions need to evaluate their long-term educational objectives, determine their optimum enrollments and sketch out their master plans for physical facilities to meet these objectives. At last, we have some funds which can be devoted to this purpose. The second new feature is a provision which permits one per cent of construction to be devoted to works of art. I am not sure that this was actually needed and could not have been accomplished by administrative determination, but this gives Congressional authority for the architect and the owner to commission murals, mosaics, sculpture, and paintings that will give grace and cultural distinction to the environment and complement the grace and distinction which you have designed into the structure itself and its site.

This leads me to talk a little bit about the philosophy which I have tried to inculcate into each of the programs which I have administered and, I think, with more than a fair share of success. It is based on the concept that colleges and universities are mature and responsible organizations characterized by enormous diversity in mission, environment, function and type of student. Each institution requesting assistance is therefore encouraged to employ a talented architect and to work with him in finding an imaginative solution to the problems of site and location, of materials and types of construction, as well as adjusting to that inexorable algebraic equation which decrees the relationship between cost and return. To plan within their economic limits, to plan wisely with a long hard look at the future, has challenged the imagination of some of our finest architects and educational planners. This concept has kept us out of the field of design and the establishment of standards, but we do not feel that we should properly abdicate all responsibility. I believe that the Government has a responsibility to encourage, to recognize and to pay homage to good design as long as it does so by indirection and example. It was in this spirit and in accord with this philosophy that I encouraged the establishment of the CFA Design Award Contest when I was Director of the College Housing Program in CFA, and I am pleased to announce that within a few weeks you will receive notice of the 1966 Design Award Contest on Academic Facilities to be sponsored jointly by the Office of Education, the American Institute of Architects and the Educational Facilities Laboratories. Bill Sheik and Harold Gores are excited about it and so am I. Art Deimel, an AIA member on my staff, is in charge of administering the program. He is here with me, and I am sure he will be glad to give you further information on it. In general, we hope to have the invitations go out in May, the entries submitted by late July and an award ceremony in Washington in late October. I hope that all of you who have worked on buildings being financed under the College Facilities Programs will consider entering your designs.

And now to change pace entirely, I would like to take you into my confidence with respect to a problem of financing which is facing my own and other agencies and results from what we call in Washington, the Viet Nam budget.

In an effort to keep afloat some of our important domestic programs, to supply the funds for Viet Nam, and at the same time to keep the budget within reasonable balance, the Bureau of the Budget is proposing some innovative financing. The proposition most simply put is that the various agencies will take the assets, bonds, notes or whatever, which they have already accumulated under their programs, pool them and offer them to the public in the form of participation certificates to be issued by the Federal National Mortgage Association (FNMA) and sold on the market. The funds so derived will be used to support further lending, and Congress will be asked to fund the difference in interest rate between that charged on the program loans and the rate carried on the participation certificates. Legislation will be proposed April 20, 1966, and we understand that it will be given a very high priority to the extent that it will keep these needed programs going during a difficult time; I hope that we can all support it. But I wanted you to know the background of it because you will hear a great deal more about it as time goes on, and it may become a controversial issue. It is not a shell game; it is an effort to fund these programs in the private sector rather than the Federal sector of the economy, and at the same time "temper the wind to the shorn lamb" with respect to interest rates insofar as our educational institutions are concerned.

It has been a pleasure to come back to my home state and to this great university and to speak to this distinguished group.

FORMULATION OF THE PROGRAM FOR DESIGN OF COLLEGE AND UNIVERSITY BUILDINGS

Frank J. Matzke

INTRODUCTION

Too often, the programming of educational facilities stops with the preparation of the educational requirements or specifications (space requirements). Although these requirements may be expressed in a detailed and comprehensive manner indicating not only the physical space requirements in square foot area, but the functional relationship of the various spaces, the mechanical requirements of each space, and the list of equipment to be placed in each space, there is not sufficient information on which to begin design of the facility.

Many other factors have an equally strong influence on the building design and must be known and understood before a concept is attempted. These factors may be already known and can be clearly stated and explained, others may be unknown, but must be determined.

FACTORS INFLUENCING DESIGN

Of primary impact on the building design are such factors as:

1. Project budget
2. Project time schedule
3. Siting considerations
4. Master Plan requirements
5. Climate
6. Codes and construction standards
7. Soil conditions
8. Performance criteria and owner preferences
9. Architect's agreement - Scope of service

All of these factors along with the educational requirements make up the program for design and should be understood and considered before the architect commits himself or his client to a particular concept. To attempt schematic design prior to having an understanding of the total scope means subjecting a concept to continual compromise as these factors are made known or uncovered.

The State University Construction Fund, which has the responsibility of designing and constructing all the physical facilities for the State University of New York, has incorporated this "understanding of the total scope concept" in its planning procedures.

OBJECTIVES OF THE STATE UNIVERSITY CONSTRUCTION FUND

The State University Construction Fund has as its principal objectives the translation of the State University's educational program into a suitable functioning facility of quality architecture within the required time and budget limitations.

We are aware that in order to achieve these objectives we must develop the optimum coordination between the interrelated agencies and the profession. We must also define for all parties involved the process in terms of logical phases of development and decision making required to successfully complete a building. Finally, for the Fund to be successful in each of the above areas, it is necessary to provide the administrative conditions within which the professions can practice to their full potential.

With these aims in mind, we have developed instructions and procedures to assist the architect in meeting our objectives.

PROJECT DEVELOPMENT PRINCIPLES

The procedures developed by the Fund for administering the design portion of the Architect's Agreements are based upon the following points:

1. That the development of a project follows a parallel pattern in which the scope of the items treated in each phase does not vary, but in which only the depth to which details are developed increases with each succeeding phase.

2. That the development of the design of a project is based on a logical hierarchy of decisions which can be grouped in phases.

By a parallel pattern of development, we mean that all elements of project design must be considered at all phases of development in order to achieve a balanced design. Although emphasis changes from phase to phase, the general pattern is a gradual increase in detail of development. To accomplish this type of development, the information presented to an architect at the time of initiation of a project should define clearly all the design conditions within which the architect may operate.

The program materials developed by the State University and the Fund attempt to accomplish this. The State University Facilities Program defines the functional and educational requirements of the project. The Comprehensive Campus Plan defines the site and spatial requirements. The State University Construction Standards, Applicable Codes and Performance Criteria define the remaining functional performance requirements. These, along with the budget and time schedules, combined as a comprehensive program of requirements define the total scope and limitations of the project. From the point of initiation of the project until its completion, this scope does not change; only the detail of development and the language in which this development is stated changes.

The following illustration graphically portrays the nature of the Fund's objectives of project development contrasted with a more conventional approach based on an incomplete program. The major disadvantages of the conventional approach are that:

1. Design becomes a trial and error process in which too much design time is devoted to defining program limitations.

2. The program may not be completely defined until after the design is complete. The trial and error design and redesign, necessary as program requirements become evident during design development, can only produce a product which is, at best, a poor compromise in which all the elements are not in balance.

The second point involves the logical progression of decisions upon which project development is based. In an undertaking such as ours, in which time is a major factor, the sequence in which decisions are made can have as much impact on project development as the decisions themselves. Basic decisions which will affect future development must be made in phase, or work done in the interim may be jeopardized. This is not a new axiom, but only a restatement of a logical approach to design development.

We have outlined these decisions, their sequence of development, and the points at which they must be summarized in the context of the special needs of our program. The specific nature of a project may require deviation from this outline, but the principle should not be lost sight of.

This paper will concentrate on the development of the program package and the activities of program phase of a typical building project.

THE PROGRAM PACKAGE

At the time of initiation of planning, the architect is furnished with a program package consisting in most cases of the following:

1. Facility Program
    - a. Space requirements
    - b. Architectural description
    - c. Description of Usage
    - d. Equipment requirements
2. Site Program
    - a. Limits of site (plot plan)
    - b. Scope of site work
        - 1) Specific requirements
        - 2) Circulation and parking
        - 3) Utility
        - 4) Grading
        - 5) Planting
3. Data and Reference
    - a. Comprehensive campus plan
    - b. Topographic survey
    - c. Subsurface information
    - d. Campus information
4. Time Schedule
5. Program Budget
6. Instructions to Architects
    - a. Administrative procedures
    - b. Operational bulletins
    - c. Performance criteria

It will not be possible to discuss each of the items contained in the program package, but the preparation of certain of these items and/or their influence on the design is discussed below:

FACILITY PROGRAM

This is the comprehensive statement of the college or university's requirements and can be best illustrated by a typical program prepared by the State University of New York for one of its buildings. The preparation of this program is the subject of a separate paper and will not be discussed in detail here. The full understanding by the architect of the college's requirements as stated in such a program prior to the start of design is paramount. This will be discussed later under the Program Phase.

HOW THE BUDGET IS DETERMINED

Basic Provisions - The development of project budgets by the State University Construction Fund begins approximately one year before commissioning of architect. At that time, a preliminary budget is developed on the basis of a preliminary, undetailed facilities program provided by the State University. This budget is used as a basis for estimating the planning costs of each project, so that necessary appropriations can be requested and be available for project planning. The following year is used by the State University of New York to complete the detail of the facilities program. Just prior to the scheduled start of planning, the Fund then analyzes the final facilities program and establishes the Program Budget for issuance to the architect.

New Construction - Building project basic budgets are established by applying unit costs to calculated gross areas and then adjusting the resulting amount for the campus location and inclusion of special items not accountable for in the base unit costs. The net area required by the program is analyzed according to functional groupings of spaces and then the gross area factor and unit cost appropriate to each functional group is applied to the related net area. This type of analysis prevents the stereotyping of projects and produces budgets more consistent with the composition of each individual program. The gross area factors and unit costs employed are developed from analysis of the actual cost of other State University of New York projects, and from cost data for comparable facilities constructed by others.

The basic budget provides for the construction of the project in its entirety and includes the following:

1. All general construction, and the mechanical and electrical systems of the building.
2. All Group I and Group II items of equipment required. These consist basically of all built-in or permanently service-connected equipment.
3. Normal foundation conditions. (Abnormal conditions are handled separately.)
4. Allowance for special features not common to the basic building type, e.g., programmed link to an existing building.
5. Adjustment of basic cost data to the locality of the project.
6. Provision for the predictable rate of escalation of costs through the time of bidding.
7. Allowance for a difference in level of finishes and systems previously used from that of the subject program.
8. Allowance for variation in cost of air conditioning for the specific net area.

The site work required by the program is carried as a separate cost item. The site budget is based upon a quality level of work that has been determined in the Comprehensive Campus Plan. The estimate of the cost is derived from past experience with work of a similar level of development.

The following items are not included in the basic construction budget for any project:

1. Architect's and engineer's fees
2. Special consultant's fees
3. Cost of soils investigation
4. Abnormal uses resulting from unusual subsurface conditions

Definition of Terms - Definition of certain terms may be necessary for understanding between the Architect and the Fund.

Net Square Feet - This is the amount of space required by State University of New York to provide specific use areas such as teaching space, lecture rooms, administrative space and similar areas. It is indicated by the State University in the Facilities Program.

Gross Square Feet - To net square foot area given in the Facilities Program is added an allowance for additional area necessary to satisfy functional planning requirements. This additional area includes such items as lavatories, corridors, wall and floor sections and mechanical work.

The net square foot area, however, is the governing factor for all spaces. If necessary, equipment, occupants, etc., may be adjusted, but no adjustment is to be made in the net square foot area without specific authorization from State University of New York.

Increase Factor - In order to arrive at the gross square foot area noted above, an increase factor, tied to each specific building type, is used.

Adjustments - Included at this time are such considerations as locality of the project, escalation, special finishes and air-conditioned spaces.

Budget Figure For a Building - The product of the net square feet times an increase factor gives the gross square foot area. This, in turn, is multiplied by a basic square foot cost figure. To this base budget are added the various adjustment allowances. (See illustration)

Since cost is a program requirement factor in the design of a project, cost estimating throughout the design process serves as a design tool. When it proceeds simultaneously with the development of design, the results of estimates may be used to revise and refine the design and to keep costs within budget allowance.

Acceptance of these principles and development of a procedure for employing cost estimates are essential for design cost control. It must be borne in mind that the architectural contract utilized by the Fund provides that, should the Architect's design exceed the budget, it will be necessary for him to redesign and rebid the project at his own expense.

Rehabilitation Projects - Where all or part of a project is rehabilitation work, or other work of a special nature in which the scope is not accurately known and which is, therefore, not readily budgeted for, then a tentative budget is provided in the program package. This budget is to be considered as an upset figure. During the program phase, a definite project scope is determined and a program estimate developed.

Should the program estimate for the scope as defined exceed the tentative budget, then the scope is evaluated by the State University, and appropriate reductions to scope are made to bring the estimate within the tentative budget. In some instances, the budget limits may be increased at the discretion of the State University. In either case, the program estimate, when approved by the Fund, becomes the project budget.

(See next page for insert)

Special Foundations - The basic building budget does not provide for special foundations or other construction required by unusual site or soils conditions (unless specifically identified). Unusual site or soils conditions are said to exist when one or more of the following conditions exist:

1. Load-bearing characteristics of the soil will not permit the use of simple spread footings for walls and columns.

2. Moisture conditions of the soil require:

    a. Pumping of excavation to permit work.

    b. Membrane waterproofing of below-grade spaces (damp proofing of basement spaces is included in basic budgets).

    c. Special floorslab construction to resist the action of hydrostatic head.

    d. Rock excavation is required to provide basement space or to provide proper bearing conditions at required elevations.

Adjustments to the basic budget to incorporate the added cost of such special conditions may be made during the course of project design, but decisions to incur such costs are made before approval of the Schematic Approach.

Site Work - The limits of the area of the site for each project are defined, generally, by a drawing issued with the site program for the project. This line indicates the limits of all surface work to be constructed with the project and generally describes the limits of necessary utility service connections for the project. Service connections may cross the project limit lines for necessary connections to manholes or trunk lines. Extensive utility runs outside of the project limit lines specifically indicated.

All site work, both surface and subsurface, is defined in the site program, and the site budget issued with the program package covers the construction of all work so indicated. This budget is derived as a product of the campus plan design using unit costs for site development. These reflect the desired quality of site development and the local conditions of the subject campus. Allowances are made for the nature of the terrain, the weather conditions, and the nature of the soil to be encountered.

Research and Study - Any new program which cannot be directly related to cost data in the possession of the Fund is assigned as a special research project to a consultant under the direction of the Fund Staff members for development of a budget.

Timing - The basic budgets derived by the Fund are adjusted for escalation to reflect project costs at the time of bidding. Additions to the budget for escalation are also made during the Construction Document Phase if it becomes apparent that the bidding of the project will occur later than the date anticipated when the basic budget was established.

INSERT

Equipment - Equipment to be built-in or permanently service-connected is designed as Group II equipment, and is provided for by an equipment allowance identified within the project construction budget. This allowance is set by the Fund and State University of New York based upon a maximum limit of cost for such equipment. The allowance may, or may not, bear a direct relationship to the equipment specified in the State University of New York facilities program issued to the architect at the commencement of planning. Experience has shown that the final list may vary considerably from the Program list. Adjustments must be made to the final list to keep within the allowance established within the project budget.

Locale - The aim of the State University is to provide facilities of equal quality at all their colleges throughout the state. The purchasing power of the dollar is not equal throughout the state; a maximum variation of approximately 12% exists.

To account for this variation, the Fund adjusts the basic budget to relate to the economic area of the state in which the college is located. This correction factor, the "area index," is derived from analysis of construction labor costs (including fringe benefits, travel etc.) in the labor market serving each campus. Materials costs are not included because of the relative uniformity of the costs of the basic building materials around the state. The analysis of the resultant labor costs yields a value which relates each campus area to a base area. The basic budget is adjusted by multiplying it by the appropriate correction factor for the locale of the project.

ESTABLISHING THE TIME SCHEDULE

Every project must be planned and constructed in accordance with an established time schedule. Many factors can influence the schedule, and the nature of the schedule has a definite influence on the design of the project. Most frequently, schedules are determined by establishing the date the facility is needed and working back in time to establish the starting dates for various phases of the project. Wherever possible, optimum periods for design and construction are used; however, certain necessary facilities must be planned and constructed on a crash basis in less than optimum periods of time. Where this occurs, definite impositions are put on the design effecting structure, type of materials, construction techniques and bidding methods.

An understanding of the owner's time requirements is necessary at the onset of a project in order that the architect may acknowledge this in his design. Proper allowance should be made, however, for review and approval periods, and sufficient contingencies should be incorporated in order that the schedule be realistic. There is no point in proceeding with a schedule that is impossible to meet. The schedule must be possible, and the architect must have the opportunity to review and advise as to whether or not he can meet this obligation. At the same time, the college and the various reviewing agencies must acknowledge their obligations in meeting the schedule by effecting decisions and approvals on time.

A hierarchy of decision making must be established and adhered to in order that planning of the project progress in a reasonable manner. Fundamental to the adherence to the schedule is the establishment of the total scope of the project prior to the start of design.

The State University Construction Fund has developed typical planning and construction schedules for the various types of facilities required by the State University of New York. These schedules are divided into increments of single work weeks and are correlated to the various phases and activities through which the planning and construction progresses. A summary of the optimum planning and construction times by building type and a detailed project schedule are illustrated. Proper allowance must be made for factors which will affect the schedule in addition to the needs of the college such as:

1. Scope and complexity of the project
2. Availability of decision makers
3. Availability of design resources
4. Availability of construction resources
5. Availability of property and/or site

6. Effect of other related projects
7. Site limitations or requirements
8. Market conditions
9. Special foundation conditions

Once the schedule is established, it must be accepted and adhered to the same as any other program requirement. Design decisions must be made in light of the schedule requirements. Revision to the program or reversal of earlier decisions by the owner must be made with a full understanding of the effects they will have on the schedule.

INFLUENCE OF THE MASTER PLAN

The current master plan for the campus will indicate the building location. It may also impose definite influences on the building design. For example, the master plan may require that the building serve as a one-story retaining wall between two levels of the campus. It may require that it serve as a focal building at the termination of a major axis or as a background building for a more important building or space. It may have to be shaped in a manner to enclose one or more sides of a planned open space, court or plaza. It may be required to be a tall building to provide interest to the form of the campus, or a low building to avoid competition with higher buildings. Such factors should be mandated by the master plan and must be understood and accepted by the architect before he starts his design. The design vocabulary established for the campus may also mandate the form, style and materials to be used.

An example of such requirements is illustrated from a typical master plan for one of the State University units.

The architect must acknowledge these conditions before he develops a concept and should work toward satisfying these requirements.

INFLUENCE OF CODES

Many good functional schemes are often scrapped or severely compromised when it is found that they contain violations of applicable codes. Valuable design time and money are lost in attempts to reconcile either the code or the design. To offset this, the State University Construction Fund recommends that the architect review the provisions of all applicable codes during the program phase and prepare an abstract of same, in order that the designer have prior knowledge of these restrictions. This is a two-way street, for such review usually indicates the restrictions as well as the non-restrictions on the design and establishes the parameters in which the designer must work. This abstract of the applicable code is also useful at later periods in the design development for reference purposes and saves reviewing agencies the trouble of digging out this information. A typical abstract is illustrated.

EFFECT OF SUBSURFACE CONDITIONS

Early knowledge of subsurface conditions allows the architect to develop a concept that acknowledges rather than ignores these conditions. The scope of the comprehensive campus planning studies undertaken by the State University Construction Fund included the taking of sufficient borings and investigation to determine whether or not the subsurface conditions would be a factor in the siting of buildings. This information is made available to the architect during the program phase in order that he may analyze it and determine whether additional preliminary investigation of subsurface conditions should be undertaken.

The prior knowledge of a high water table or unstable soil conditions can have a decided influence on the architects' initial concept and can save both time and money for the owner. Should these conditions be found out after commitment to a developed scheme or design, the owner is forced into a decision to increase budgets for costly waterproofing of basement areas and/or special foundations or else to expend the time and money for redesign.

THE PROGRAM PHASE

Fundamental to the development of a full understanding of the full scope of the project by the architect prior to the undertaking of the design is the program phase of the project. During this phase of the work, the college and the architect work closely to define in detail the educational requirements. The architect visits the site to familiarize himself with the physical limitations on the project, and he reviews and comments on the material forwarded to him with the program package. The program phase is concluded with the submission and approval of a program report prepared by the architect. This report then becomes the program for the design of the facility. The activities during the program phase are described below and include:

Orientation Meeting - An orientation meeting is scheduled early in the program phase to allow the architect and his consultants to meet with the college administrators and faculty who will be involved in the planning of the facility. At this meeting, the requirements of the spaces outlined in the facilities program are discussed in detail. Special mechanical and equipment requirements are reviewed, and the functional relationship to other spaces is determined and diagrammed. This may consist of a single day-long meeting or a series of several meetings depending on the complexity of the program.

At this meeting, the time schedule established for the project is reviewed in order that all may understand their responsibilities to adhere to the schedule. The implications of changes in program or scope are discussed in relation to their effects on the schedule.

The project budget is also reviewed in order that all participants in the planning process fully understand the cost limitations set for the project and their relationships to the project scope.

The objectives of the orientation meeting may be summarized as follows:

1. Develop a full understanding of the educational, functional, equipment and mechanical requirements of the project.

2. Define the procedures to be followed in the planning and construction of the project.

3. Discuss, review and accept the time schedule established for the project.

4. Determine the responsibilities of the people to be involved and establish the channels for information gathering and decision making.

5. Review the project budget and acknowledge same as a design objective.

6. Record any program revisions or refinements.

Site Visit - During the program phase, it is important that the architect and his consultants visit the site and familiarize themselves with the physical limitations that the site will impose upon the design. The visit to the site should be properly organized, and sufficient time should be allocated to insure accomplishment of the following:

1. Determination of the boundaries of the site and relationship to adjacent areas.
2. A detailed study of the existing topography including general character, location of terrain features, location of trees, plant material and landscape features, rock outcrops, drainage pattern, views and landmarks.
3. A study of existing and proposed circulation patterns for vehicles, service and pedestrians including relationships to public highways, transportation system and parking areas.
4. Investigation of existing and/or proposed locations of utility lines and services including sanitary sewers, storm sewers, electric service, heat-distribution systems, signal conduit, gas lines and water lines.
5. An understanding of the environmental relationships including relationship of proposed building site to existing and proposed future structures, character of existing campus and character of surrounding locale.
6. Determination of local climate conditions and effects on project including degree days, rainfall, snowfall, length of planting season, proximity to large bodies of water and prevailing winds.

These understandings and conclusions reached by the architect should be documented on maps and drawings and reported in a site analysis to be included with the program report.

THE PROGRAM REPORT

The program phase of the project concludes with the preparation and submission of a program report by the architect. This report then serves as the program for the design and as a record of the understandings upon which the architect undertakes the project. Included in the report are the following:

Facilities Program with all changes and revisions recorded by addendum.

Ideal Functional Diagrams which translate the functional relationships of the program to graphic form, showing relative volumes of circulation.

Site-Related Functional Diagram showing relationship of building to circulation, service, parking and other facilities.

Site Analysis describing significant features of the physical environment and characteristics of the site. This analysis should state the influence on design of such factors as climate, topography, soil condition, ecology, utilities, circulation, views, noise, existing structures and objectives of the master plan.

Site Analysis Diagram illustrating the factors described in the site analysis and features and limitations of the site.

Program Budget identifying the net area, optimum gross area, building budget, special allowances, site budget and total project budget.

Design and Construction Schedule indicating submission and approval dates, phase completion dates, anticipated bid date and completion date of the project.

SUMMARY

Many factors influence the design of any college or university building, and an early understanding and comprehension of these factors by the architect is necessary. Concentration on the development of the full scope of the project prior to the start of design will allow the planning to proceed in a logical and expeditious fashion. Before authorizing the preparation of schematic drawings, the college or university should be assured that the complete program of requirements has been established, and that all participants in the planning process have a full understanding of their responsibilities.

The development of a comprehensive program of requirements as outlined above will greatly aid the architect in satisfying the objectives of the college or university and will help insure facilities that will be a credit to all involved in the planning process.

SUMMATION PANEL

April 18, 1966

Mr. Deimel--I should like to elaborate just a little bit on this design of work program which Mr. du Von mentioned earlier. As he told you, the Higher Education Facilities of 1963 has generated quite a bit of college construction work both in expansion and new campus work. It is a fairly new program, and during the first year (fiscal year of its operation which ended June, 1965), the work that was generated from loans and grants by the Higher Education Facilities Act amounted to over 1 1/3 billion dollars in construction. This year, the work will be greatly increased; we are processing applications in very large numbers. In one item, alone, entitled "Want Grant," the amount will be doubled over last year, so we expect quite a large program. Now, while the government does not set standards of design, it is concerned with the quality of architecture; the design of work program is our way of recognizing excellency in architecture. This program is being sponsored jointly with the American Institute of Architects and the Education Facilities Laboratories. The invitations for this program will probably be going out some time around the middle of May. Judgment will take place in August, and the deadline for admissions will be towards the latter part of July; there will be an elaborate awards ceremony in Washington some time in October. All the projects for which applications for grants and loans have been approved under the Higher Education Facilities Act will be eligible to compete. All those architects who are involved in this will be receiving these invitations some time in May. The categories that we will judge will include both completed buildings and buildings on which the applications have been approved, so long as the architect has the necessary material to submit. We will require photographs both on interiors and exteriors for completed buildings and also the necessary plans, sections, and other material that will be spelled out in this program. The categories will also be divided into academic buildings, scientific laboratories and research buildings, college libraries, graduate buildings and campus development plans. Judgment will be in all these categories both in completed and incompleted buildings. There is one deviation, however, in the type of program which, in other ways, will be similar to the usual annual award program which you are familiar with from the American Institute of Architects. The deviation is this--that, in addition to a descriptive statement by the architect from his project, we will also require a statement by the president of the institution signed by him or his representative in which he will describe significant features of design and outstanding solutions of problems. This is to encourage a close collaboration between the institution and the architects during the development stage. As Mr. Katzenbach so ably stated in his opening remarks earlier, he said we need to have the educational community say enough to their architect about their needs, their ideas, what they are teaching and how they are teaching; this will encourage this type of activity in the development stage. While both Mr. Bareither and Mr. Matzke pointed out all the elaborate needs of programming and space analysis which, of course, is very necessary, this does not necessarily limit the architect's ability to add his own creative thoughts to the project, and we are trying to encourage that. In the judgment of these competitions, careful considerations will be given to submittals that exhibit efficiency of function conducive to improvements in education, execution of complex programs, environmental harmony and a realization that excellent architecture is not necessarily synonymous with higher costs. Submissions will, of course, include plans, sections, etc. Our objectives will be, however, to evaluate buildings and not to reward the photographer's skill. We expect to have five judges selected, of whom there will three architects, and the selection will be done in collaboration with the AIA, the Educational Facilities Laboratories and the Bureau of Higher Education. As I mentioned to you, the invitations will be sent out some time in the middle of May when I hope you will know more about it; I trust that you will look for it and participate.

Dr. Brandis--We will begin now with the question period, and Mr. du Von, we will open by asking you to expand on a statement which you made--that your office does not want to influence architecture except by indirection and example.

Mr. du Von--I think that the Design Award Contest that Mr. Deimel just explained to you is a good example of indirection and example. In other words, we will award with certificates and plaques the buildings that your own peers judge to be excellent. We are not setting ourselves up as experts. We are not trying to influence architecture by establishing federal standards, by insisting on use of certain materials. We are leaving to the college and to the architect the greatest possible freedom. However, we do think that by rewarding through plaques and certificates and holding an Award Contest, we are operating by indirection and example.

Dr. Brandis--A question from Mr. Matzke--if the budget and program are fixed prior to engagement of an architect, what is the architect's responsibility in meeting this budget?

Mr. du Von--I assume that the responsibility is first understanding it. I might mention that we have an architect's agreement which is somewhat unique because we have incorporated within the agreement the requirement that he design a building within the budget established, so that his acceptance of that charge to design a facility is the acceptance that he will undertake the budget as a program requirement. In the event that the bids received for the project exceed the budget, he can at the option of the firm be required to redesign the facility and advertise it at his own cost. Now, this sounds like pretty hard language to use in an architect's agreement. We found not only the program of the size of ours that small percentages of differences or increases over the budget can have a major effect on the financing ability of state universities to provide these facilities. We have been careful through the program phase project to indicate to the architect the basis on which we built the budget which I will try to outline very briefly here. We have asked him to spend a great deal of time in analyzing the costs of the particular design he proposes for the project, so that he and we, at all times, are conscious of whether or not his design is capable of being built within the budget. This goes beyond the ordinary estimating required or is customarily done by an architect, but it requires, in many cases, that he take on expert cost consultants who can actually go out into the field and make determinations as to the market conditions and the effect these conditions will have on the price of the particular type structure he proposes in the particular area where the building is to be built. This means that if you have an area where you have an abundance of brick masons, you don't consider a concrete building, particularly if there is a shortage of carpenters to do the form work, etc. But I think the architect is required by his agreement to accept the budget as a design requirement. Now this doesn't mean that there will be unusual conditions which wouldn't affect it. We do allow, as I said, some of these things as developed to affect the budget. I didn't mention some of the other factors that might influence the budget. One is a program change by the state university which in a late stage of design development has to be considered not from the pure sense that it is a development of the original budget, but the effect it would have on that particular design. We consciously make a decision whether to scrap the design as developed to incorporate the program change or whether we allow an adjustment in the design to incorporate the program change; and, thus, maybe pay a higher cost for that change than you might if you were using that area initially to establish the budget. The other factors that come into being may be a determination of unusual market conditions or lack of competition or the effect of other programs in this particular area which become known in a later stage in the project development. At that time, we cannot hold the architect responsible for a condition that developed beyond his control, and we take this into consideration in either adjusting the budget or at the time we make a decision as to whether the architect has a responsibility of redesigning the project if the bids exceed what had been budgeted.

Dr. Brandis--I have a question for Mr. Bareither which I did not write but as a member of the University faculty, I am extremely interested in hearing the answer. How do you figure what department shall be moved into the buildings that are phase data?

Mr. Bareither--We always start our calculations for each department; we summarize these by colleges and then the material is sent in a booklet similar to this to each dean of the college. This shows the conditions that exist of the facilities they have at the present and facilities they will need in the future--both in terms of building blocks and their own department. From this, the college itself will determine from the space that they have and what facilities they are going to request how they would desire to move the various departments within their college in this space. For example, a college may decide that we will build a modern foreign languages building. When they do this, the space that is going to be vacated by the modern foreign languages people of the existing facilities will then be planned to be occupied by other members of that college and the departments of that college. Or else it may be released for complete re-assignment to another college. Now these points are all agreed upon before we start programming a building, and, in general, the college will make the first overture as to their desires; then we will negotiate from this point.

Dr. Brandis--A question for Mr. du Von. The bond issue now appears to go contrary to attempts to reduce capital investments. Please comment.

Mr. du Von--I'm not sure, however, that I completely understand that question. I assume, sir, that reference has been made to some of the President's statements recently urging a reduction in building expansion of all kinds--federal, state and local. I hope I am reading the question correctly.

Dr. Brandis--Yes, I think that is what it means.

Mr. du Von--I guess from the standpoint of an economist, what the Bureau of the Budget is trying to do here is to take these capital expenditures out of the federal sector and put them into the private sector where they will have to compete on the basis of interest rates with other on-going financing. If these announced participation certificates will command an interest rate of 5½ or 5 3/4%, the government is perfectly willing to accept that loss with respect to what they could borrow using the credit of the federal government itself. It is in a sense contradictory, as you know, particularly when we are in a period of trying to take care of a war in Viet Nam, continue with butter at home, and not raise taxes. You can get into some very contradictory positions.

Dr. Brandis--I think you have at least in part answered a couple of other questions, and I think we will take those right now. Who will make up the difference between 3% loan rate and 5½% interest rate in the proposed participation certificates program?

Mr. du Von--The Appropriations Committee will appropriate funds to make what is now quite frankly a subsidy. It will be an appropriation for the subsidization of the financing of the college facilities.

Dr. Brandis--Another question. The present interest rate is 3% on HHFA. What do you see the interest rate as being in years to come, 1966-67 for instance?

Mr. du Von--Well, it is the present policy of the administration to temper the whim to the shorn lamb--the shorn lamb being higher education. It is fairly conceivable that there will be a program of federal assistance to elementary and secondary schools from this Congress. If so, it will undoubtedly be financed on the same basis. It will be financed with participation certificates with the Congress being asked to make up the interest rate subsidy which is involved in the differential between the two rates.

Dr. Brandis--Could I take the privilege of pressing you one step further. During World War II, there was an actual governmental control of construction; that is to say, it didn't make any difference whether you had plenty or how much you were willing to pay interest on your money, you couldn't build something unless you got governmental permission to put up the building. Do you see anything of this nature in the wind in connection with higher education?

Mr. du Von--Yes, I do. I have a feeling, depending on what happens in Viet Nam, that we are very rapidly approaching the days of 1940 and '41 when there were controls on credit, controls on prices, controls on wages and controls on critical materials. The Business Manager at the University of Iowa sent me a letter the other day which he had received from his copper supplier. His copper supplier said that at the present time they had adequate inventories but within three months they anticipate that they would be unable to fill orders unless the orders are accompanied by DO or DX priority. These priorities at the present time are only available to the military; I believe to the Space Agency. If Higher Education jobs start being held up because of a shortage of critical materials, it seems to me that there will have to be an extension of the priority system to other essentials of civilian needs which I think Higher Education will be one of them.

Dr. Brandis--Well, I am sure that if there isn't the copper shortage yet, there is going to be as soon as you get back and report to your purchasing agents. I have a number of questions for Mr. Matzke in the general area of fees which may be of some interest to some of you. One is how much extra fee, if any, is paid to the executive architect for his production for the program of project or this phase of professional service included from the beginning and included in the fee payout? The second question is what is the average architectural fee? The third is, since you do a good deal of the programming, what is the fee for the project architect?

Mr. Matzke--In order to answer these questions, I can very briefly run through just what our fee covers. I think that when we talk about architect's fees and if you talk about percentages of construction costs as related to the basis of determining architects' fees, we talk in sort of a dark area because if we were to say we paid our architects 6% and you say you paid yours 6½%, it wouldn't mean a thing until we both agreed upon the scope of services that was being required by each of us. We have prepared a form of agreement with our architects, and it includes within the scope of his services his participation during this program phase. This means that if we had a program package, he spends a period of generally about six weeks in a program phase doing the detailed development of the various program entities that we talked about, studying the site, the orientation meetings with the client, developing the functional relationships with the various aspects of the program, studying the project, reviewing the time schedule, etc., all part of the program phase. The architect, then, from that point on proceeds from the program phase into the schematic design development. This is a sort of two-stage phase for which we are responsible first for the development of a concept which he gets approval of before proceeding into detailed schematic design which brings in consultants in mechanical and structural, etc., and start to outline the various systems to be employed in the building. We go from the schematic design phase into what we call a design-manual phase which is the development of detailed preliminary drawings, detailed to the extent that the design for the project is accomplished during the design manual phase. These design decisions are recorded in what we call a design manual which amounts to preliminary drawings for the building, outline specifications for the various systems, materials, etc. to be used, the developed site plan for the building. This leaves to be done the conversion of this design to the contractor's language which is essentially the development of working documents and specifications. Proceeding through the development of working documents and specifications, he then has the responsibility of presenting to us a bid package which we review, bringing into the picture all the special conditions, general conditions, information for bidders, etc., which the architect prepares based on somewhat standard documents to be used for our purposes. He has the responsibility of putting this whole package together. He has the responsibility of taking the advertisement in the papers, of seeing that the advertisement is put out and controlling this, of issuing the drawings to specifications to the interested bidders, of also contacting both personally by telephone or telegram any contractors who he feels can be brought into it. He has also an obligation of participating in meetings with contractor groups and associations to promote interest in the project. He sits at a meeting with us at the time we receive bids. He participates in the discussions on the award and before we will make an award, we have to have his recommendation as to whom we will award the contract to, although there are certain requirements prescribed by law which must be met by the contractor. In order to award a contract, we make the architect very much a part of this process and when finally awarded the contract, the architect prepares the actual contract documents, certifies as to their completeness, etc., and supplies the contractor and our office with the actual contract to be used. He then supervises the construction; I really shouldn't use that word because the AIA now says the architect administers the construction contract during the construction phase of the project, but none of us can describe that without using the word, supervision. He participates in this; he hires resident inspectors to be used on the project, puts them on his payroll; this is an extra service for which we reimburse these salaries and pay an overriding percentage. He administers the project through the construction phase, does the checking of shop drawings, etc. He certifies contractor's requisitions for payment and then performs the final inspection of the project not only at the occupancy time but also a year later when the guarantee is up, he participates in a field inspection of the project and indicates to us and certifies that the contractor has done work in accordance with the contract documents. Now, this just generally describes the architect's work which is included in his percentage fee. In addition to that, he performs other services for us which are reimbursed to him. He travels back and forth from his office to our office and to the job site as required. This is reimbursed as a separate item. In many architectural agreements, the travel is included in the architect's fee; however, in the case where we pay, this is an extra. He performs such services as writing specifications, preparing the drawing and administering the taking of saw borings, etc. For this, we pay him an additional fee. Usually, it is worked out as a percentage to the actual cost of the contract. He may in some cases engage a surveyor to do either general or specific site surveying, preparation of topographic surveys, etc. Again, we reimburse him the cost of the surveyors' services plus a percentage for the time it takes him to administer this. He performs special studies for us at various times. We may have a particular type building on which we have little background. In order to arrive at a reasonable budget cost factor, we may ask him to do a particular study on this. Again, this is a reimbursable item. As I mentioned before, he employs the corps for the works, and we reimburse the corps for their salaries plus paying generally 25% override to cover the administrative costs to put this man on the payroll, etc. So you have to understand this in order to understand our fee structure. Then we come to the area of fees themselves. We have set this up on a sliding scale, so that it depends on the construction dollar value of the project as to what the actual percentage fee will be. Without having this schedule, it is pretty hard to see what those are, but basically the fees range between 6 and 7 per cent on the average building project. Now as this project gets larger, of course, the percentage fee comes down. The more repetitive the elements of the project may be, the lower the fee. There are other areas of architects' service where we may set up a different basis for payment other than percentage fee. In some cases because of, for instance, a rehabilitation project where the scope of the work is inducted at the start of the project, we may ask the architect to do a special programming study for us which we would do as a multiple time basis. In other words, we would pay him usually 2½ times his technical payroll to perform this service for arriving at a program for the building and an estimate of the cost to do this type of work which we will review with the state university. If we can agree on this scope, they may have already fixed the dollar value and they say, "let's see what we can cut out of this to stay within so many dollars." Or they may agree to increase budgets in order to do all the work that is outlined. In any case, we will arrive at some conclusions and then continue the project from that point on. After the scope and construction costs or estimate of construction costs are generally known, we may proceed from that point on a basis of a percentage fee. There are other areas, for instance, in the area of comprehensive planning and master planning where we do all this on a multiple of time basis. We will establish an upset floor plan, and most of the comprehensive plans we did were in the order of initial upset of $80,000 to $100,000 based on 2½ times technical costs. In the process, these things erupt, so that I would say on the average state university campus, we spend somewhere between $150,000 and $200,000 for the master planning. So I don't think I can answer the question exactly as put to us, but I think I worked around it just to give you an idea of how we establish the fee. The one thing I would like to point out is that we have found that there are some areas where we based the fee on the total construction costs, so that there are other areas which have to be worked out as how to pay for change orders, the responsibility for change orders, preparation for them, etc., as they may affect construction costs for different things that we have worked out in detail. I think the only way I could give you a definite answer to some of these questions is to have the actual documents and show you how it is covered in the documents.

Dr. Brandis--Could I follow that with a two-part question which bears on this? What part (and I am going to insert--if any) does the architect play in the equipment procurement and if he does, what is the increase in fee to cover this?

Mr. Matzke--I will have to explain the type of equipment involved. We have established groups of equipment for the State of New York and included in the first group--Group 1 would be building equipment and that is generally required for the operation of the building itself. This includes toilet fixtures, lavatories, etc., or a Somad unit which may be connected with the kitchen or something of this nature. Group 2 includes generally specialized equipment, for instance, food service equipment which is necessary to the building operation or laboratory equipment in furniture which can be identified as a separate thing and included within a science laboratory. Both Groups 1 and 2 are generally included in the construction price of the building, and, therefore, the percentage fee as used against the building construction costs compensates for the design specification layout of this equipment. Now, we have a further category, Group 3 equipment, which is space-occupying equipment--tables, chairs, etc., which may or may not require services, generally not permanently connected but acts as a table or desk in a professor's office which may require or have a relationship to an electrical outlet or telephone but is not actually connected to it. This type of equipment is purchased for the state by the Division of Standards and Purchase of the Office of General Services which buys much of this on annual state contracts. The architect is responsible for laying out this equipment in his initial design; however, here the actual selection and specification are done as extra services someone required. In many buildings, we have asked the architect to go back and work this out: for instance, select drapery materials and coordination of the fabric, fabric color and color of furniture, etc. We ask the architect to do this and pay him an extra service for this type of work. Usually, we furnish him with the available state contract outlined, in general, what is required, and he works within certain perimeters directly with the unit in establishing these lists. He does not do the detailed specifications for this type of equipment; usually this is already on a state contract, but it is a matter more of selection.

Dr. Brandis--Mr. Deimel, I have a question for you. What is your Division doing about campus plan studies?

Mr. Deimel--I am glad you asked because we have some rather interesting plans on this. Through the initiative of Mr. du Von, I think there has been some allotment made in future budgets of approximately $4 million to help finance long-range campus planning; we are anticipating future programs along that line to begin with the guidance of the AIA and authorities in campus planning, leaving the details of the design features to the experts.

Dr. Brandis--Mr. du Von, I have a question regarding studies, if any, that have been made or are being made regarding the actual comparative costs of financing construction by the use of Federal funds versus private funds. If there are such studies, how can we get hold of them?

Mr. du Von--I do not know of any such studies, but I think they would be very useful. I think perhaps some of you will be in a position to give us a judgment. You must have cases where Federal funds involve or where they do not involve. You would know the significant areas where element of involvement has increased your costs. The one that comes immediately to mind is the Davis Bates requirements for paying prevailing wages which I am sure in come areas tend to increase the cost of federally financed projects. In fact, one little community in Maine where there is a college by the name of Nassau told me that if they had to pay Davis Bates wage rates, it would entirely outweigh the advantage of the low-interest rate on the loan. This is because the Department of Labor establishes wage rates which are for the largest metropolitan areas, rather than the wages which may be prevailing in a non-unionized situation in a small community.

Dr. Brandis--Mr. Bareither, a two-part question for you. With whom do you develop project budgets? Are program committees established at the earliest stage whose members will challenge and formulate educational philosophy?

Mr. Bareither--Let's answer the first one regarding project budgets. This is developed by the architect, the university architect. The steps that precede this development of the budget is the second part of the question which our program committees established at the early stage. At the time that the college decides or determines that this is the type of building that they would desire to construct, the college will appoint a program committee or a chairman to be involved in this program. This person and my office work together on developing the total facilities required. Then, at this time after we have reached an agreement between the department, the college and my office, a letter is written to the Executive Vice President and Provost which is called a letter to request the preparation of a program statement. If this is approved, then various other administrative offices are notified at this time, certain people involved in site selection, etc. This starts a lot of various administrative units into operation. Then the program is developed in conjunction with these people of the department and personnel from my office. As we get farther and farther along into the program, we bring the architect in on the final stage when everything is decided as to what is required. The architect will set the project budget, based upon a time schedule as to when we think the building will be constructed. The architect is not kept out the picture all along. He is aware of this project at its inception, namely, the request to prepare the program statement. But it is our responsibility to prepare the program statement and when it is prepared, we are phased out; the architect takes it from this point. We are then brought in to review the project as it proceeds, the preliminary stage, etc., to make sure that the net square feet are constructed. I think this is the same thing that you do, Frank.

Dr. Brandis--When you use the word, architect, you mean the university architect?

Mr. Bareither--That is correct.

Dr. Brandis--I have a group of questions for Mr. Matzke. I think they can be summarized. I will read them all so you will have the picture. Where does the construction money come from? Who are and what are the final approval authority? When is the money available for the several phases of the project? Please describe the financing of the State University Construction Fund in New York. Have you been able to use your program documents to support an application for matching construction grants--NIH? Where does the state dormitory authority fit into New York's building program on campus?

Mr. Matzke--The financing of State University Construction Fund, let's say who makes up the money, actually comes from an income fund established by the state university which puts student tuition fees and everything into a general income fund. Now, we have first-instance appropriations which are made by the state legislature and in order for us to undertake planning these projects and in order to get construction started, each building that is built under the State University Construction Fund is financed by bonds that go through the state division of housing and are paid off by money. I think it comes out of the State University income fund, so that every time we put up a building and award a construction contract, we can immediately mortgage that building. I don't know what's ever going to happen if the income fund is insufficient to pay these off because I don't know how you foreclose and sell this to somebody else. This is the setup we have. Actually, the program is a rather detailed thing; and this isn't my particular area, but I can say that this is what is described as a general basis. As for, where does this construction money come from--well, this is the same thing. It's from the selling of bonds and first-instance appropriations which are repaid by the selling of bonds and the bonds are paid off by the income fund. Who or what has final review of approval authority? The review of final and approval authority rests with the State University of New York which is the client of the State University Construction Fund; by law, they have the right to approve the architectural concept in developing our working relationships. With the state universities, sometimes we have had a question as to what defines architectural concept, but I think that we have a pretty good procedural and working agreement with the Office of Facilities of the State University which acts for the State University in this regard. Usually at the time of the development of an architectural concept, the presentation meeting is arranged with the architect;

and he presents his concept to representatives of the college and the central offices, and the State University gets their approval on the concept. We proceed through on this type of joint review and approval basis through the approval of the designs manual. From that point on, the State University fund and the architect work together in the development of the construction document; then at the time we put the project out for bid, we advise the State University that we are advertising this particular project. We do not submit the final working drawings and documents for their review. This is a responsibility that we assume ourselves. Now this doesn't mean that it is the perfect system because there are times when a building gets out, gets under construction and you find that some aspects of it have been changed from what the State University thought they had approved in the design manual phase; these are some of the things we have to watch out for and police. Essentially, this is the way we are set up. The money for the various phases of a project includes planning money which is made available at least a year in advance of construction money, so that we are able to completely plan a facility, pay for the architects, etc., as we go along. Had we been able to use our program documents to support an application for a matching construction grant from the NIH, we have, to some degree. We are in the process now of revising some of our material, so that it is compatible with these requests. For instance, we have developed our own set of general conditions. Working with the Contractors' Association and the State of New York and the architects, we find that we will now have to amend these in order to meet some of the Federal requirements. There have been other aspects of our program such as the methods that we use with alternates, such as we have already been down and talked to Jay about. We have set up the basis that we would award a contract on the net results of having taken the base bid and then accepting or rejecting certain alternates, so that the low-base bidder may not necessarily be the person to whom we award the contract. After we have determined what alternate we will accept, this may change the order of bidding; we have been awarding contracts on this basis. This has not been acceptable to the Federal Government, so that on those federally supported projects, we have to revise this in order to meet with their requirements. We are still working on this type of liaison and hopefully will be able to incorporate some of these things into our processes. Where does the State Dormitory Authority fit into New York's building program on campuses? The State University Construction Fund, I said, had the responsibility for designing and constructing facilities for the State University of New York. Initially, the State Dormitory Authority was created about 1949 to provide, to design and construct dormitories for state university facilities throughout the state. This was the only mission of the State Dormitory Authority. Since that time, its mission has been expanded to design and finance the construction to dormitories for not only the public sponsor but the private institutions of higher learning in the State of New York. Since that has been further expanded, the state dormitories can finance the design and construction of academic buildings for private institutions. It does not have the authority to do anything other than dormitories and dining halls for the State University. The law that created the State University Construction Fund was specific in stating that the construction fund would give first refusal to the State Dormitory Authority when it came to the design and construction of dormitory facilities. We have been able to work out procedures with the Dormitory Authority in order that they may provide the dormitories for the various state university campuses. Our procedure now is set up so that we are in a position to recommend to the Dormitory Authority the architects they will engage in these particular buildings. They develop these buildings under procedures and working arrangements to satisfy the requirements of our master plans, etc. The State Dormitory Authority does have a very important role in the State of New York, particularly in this expanding area of financing by the college construction.

Dr. Brandis--Mr. du Von, do you want to comment on the problem from the other side? That is to say, allowing the Federal government to work with documents which state authorities find necessary.

Mr. du Von--We try to adjust our requirements to the state requirements whenever possible, but there are times when it is just impossible. We can't go quite that far. This particular case that you spoke of is a good example of that. Under government programs, we have always insisted that the award be to the lowest responsible bidder and if any alternates are accepted, they must be ordered; the reasons, I think, are perfectly obvious. If you don't do this, there is a possibility of selecting the bidder that you want by an adjustment of alternates. So we have had to remain out here on that point, but I think we have worked out a compromise with the people in the state of New York which will be acceptable to them and to us.

Dr. Brandis--Another question for you on a very different phase. Will 1% of the construction budget allocated for art be broad enough to include funds for creative landscaping, lighting, pools, plazas, and fountains, or only the major arts of painting and sculpture?

Mr. du Von--I would say that with the existing circumstances, even without the change in the law, it is perfectly possible to include site improvements of this kind. I think the work of art concept has to do with the direct mission of works of art--murals, mosaics, sculpture and things of this kind--where you don't have to go to competitive bidding process to commission the artist any more than you would have to go to competitive bidding process in selecting your architect.

Dr. Brandis--Mr. Matzke, does your office or the college select the architect?

Mr. Matzke--Our office selects the architect. By our office, I mean the Planning Division of the State University Construction Fund has the responsibility of interviewing reviewing work of the architects interested in our program and making a recommendation to our Board of Trustees as to which architect be commissioned for a particular project.

Dr. Brandis--Mr. Bareither, what method are you using to program outdoor collegiate athletic requirements including those for instructional use, intercollegiate athletic use and recreational use?

Mr. Bareither--I can answer that one quite easily. It isn't my responsibility but to go on farther, I think as far as the outdoor athletic requirements I would consider as recreation requirements. The general policy at this time has been that the building site takes a recreational facility; it is relocated in some other area and this is usually agreed upon by the College of Physical Education and our campus development group. I think one of the reasons we have not had any problems as far as the use for instructional facilities is concerned is because at a residential-type institution that has either a four-year curriculum or over, which is fairly complex, you will find that the recreational requirements if they are satisfied, you will have enough facilities for instructional use. In line with this, we are getting into this a little bit farther, and we do have a very good publication by some personnel on our staff in the College of Physical Education. They have made a study of all the institutions in the Big Ten as to their outdoor and indoor requirements. Our indoor requirements have been established with them. We have not arrived at anything on the outdoor requirements because I guess that you could say that this is something like the "squeaking wheel gets oil" and this one hasn't squeaked too much yet.

Dr. Brandis--Mr. du Von, is there any estimate of the approximate publication date of the proposed program of participation private lending that you describe?

Mr. du Von--The legislation will be introduced on Wednesday. I imagine hearings will be held shortly. It is very hard to see through the crystal ball as to how fast Congress is going to move on it, but I think that the administration is prepared to move very rapidly. The technique is not entirely new. Fannie May has been doing it for its own mortgages and has also been accepting VA mortgages and putting these into participation pools. The technique has already been established. There is a certain amount of market awareness of this type of financing. I don't think it will take long to get it under way.

Dr. Brandis--We stand adjourned.

COLLEGE HOUSING AS LEARNING CENTERS

H. C. Riker

Conferences, such as this one, to consider campus planning and college building design are vitally important to institutions of higher education in this country today for at least two reasons: first, the urgent need for these institutions to do a better job in educating students and, second, the active influence of the physical facilities of the campus--both residential and instructional--on the educational job done by students, faculty and administrators.

Although the relationships between facilities and performance on the campus require intensive research, there are a few indicators that the physical and social environments into which a student is placed by his housing assignment set the pattern for his success or failure. Another way of saying the same thing is that residential buildings and their uses influence behavior to the extent that the college or university sometimes predetermines student failure through the kind of housing it provides.

Three major points should be kept in mind as we think together about college housing:

First, college housing can be successfully studied and planned only within the context of the institution of which it is a part. By context, I mean particularly the character and curriculum of the institution.

Second, college residence buildings must be understood as peculiarly educational in nature, in terms of specific uses, physiological and psychological effect, and functional relationships with other buildings and with the campus as a whole. In other words, college housing is not a hotel or motel, and it cannot be wisely planned as a unit independent of the rest of the campus.

And, third, planning for college housing must be based on the best available knowledge about all the factors involved in the uses of housing on a particular campus. This knowledge is admittedly limited in quantity and often difficult to obtain, to the extent that all of us concerned have a real responsibility to aid in the production of more factual data upon which sound planning decisions can be made.

Research has become an essential activity of industry and government. Research grants now contribute substantially to the operating budgets of many universities. But when it comes to developing more knowledge about buildings, including those on the college campus, and how they affect their inhabitants, much work remains to be done. As a matter of interest, I wonder how many of the architectural firms in this country support research activities which will enable them to plan more effective educational structures. What kinds of research programs are under way in our architectural schools at the graduate level? Are we turning out young architects with real understanding of the nature of the educational enterprise, so that they can participate effectively in the planning of educational buildings, residential or otherwise? I have the impression that there are great opportunities for improvement. And I am suggesting--urging--that we resolve here and now to take action.

A frequent procedure used by planners in accumulating information for new buildings is to travel to other campuses, taking pictures and making notes on what other institutions are building. The common result is a new building which represents a refinement on the mistakes of others. Of course, the visitation procedure has merits, but it is seldom the source of new insights developed from careful study of cause and effect.

On the other hand, new buildings of all kinds are sprouting on college campuses across the country. Entirely new campuses are spreading over land just recently occupied by woods, or pastures, or tenements, and fresh brick and concrete and glass thrust up out of raw earth with footpaths already beaten to the doorways of expanded educational opportunity. As many as 181 new institutions were opened during the four years between 1961 and 1965. On my own campus, and elsewhere, the existing physical plant is being doubled in capacity within a period of 6 to 10 years; and more impressive figures than these can be cited.

What are the new buildings like? Some are impressive and some are just buildings. But beyond appearances, I wonder what difference these buildings are making in the lives of the colleges and universities, and their students. There are more classrooms, more laboratories, more offices, more space for books and equipment, more rooms for students to sleep in, eat in, play in, and study in. But are these students learning more than their predecessors? Are they more effective persons? Are fewer students dropping out, now that admission standards are up? And are students more excited by the special opportunity that is theirs to learn and to grow? The evidence is dismaying.

I have already mentioned the urgent need for college and universities to do a better job of educating students. The best available information indicates that four-year institutions of higher learning are currently graduating roughly 50 per cent of those who enroll as first-time students. In September, 1966, more than 1,450,000 students enrolled for the first time, and of these about 725,000 can be expected to complete a regular four-year program and obtain a degree. What a tragic waste of human resources and, in addition, what a waste of time and money. During the 1964-65 fiscal year, colleges and universities spent $11.9 billion, and half of their teaching effort ended in failure! Here is a record that would have put most enterprises out of business. Keep in mind that the annual expenditures of higher educational institutions are expected to rise from $11.9 to $22.5 billion by 1974.

In spite of this record, the American people are relying more and more heavily on education, particularly at the higher levels, to develop a competent citizenry and to provide suitable answers to today's vexing problems. The time is at hand, however, when the combination of thousands of college dropouts and thousands of additional dollars to expand and operate higher educational institutions will force a close scrutiny of existing procedures, conditions, results, and reasons. Educators and planners should not delay in working closely together to bring about marked improvements.

It should be obvious that all elements of the institution, including college housing, must be fully utilized to produce maximum educational results. At the present time, however, only a relatively few administrators are making use of their housing for explicit educational purposes; others are exploring the possibilities; most are concerned only with the increasing costs for construction and operation. The tremendous expansion requirements have created an interest in college housing on the part of investment agencies which foresee a new field of financial opportunity, and I trust that this interest can effectively supplement our institutional housing requirements. At the same time, these requirements must be consistently defined and met in terms of educational goals.

Please understand that I fully recognize the provision of satisfactory physical facilities for studying, sleeping, and eating as a basic objective for college housing. However, I am emphasizing the educational objective because housing must be understood and used as an educational instrument if it is to produce an adequate return on the investment made. My remarks carry the title, "College Housing as Learning Centers," to emphasize that this is our only logical planning objective for major construction on the college campus. Before considering college housing specifically, may I suggest that we think first about the future college and university, rather than merely review the present in order to build a backdrop against which our plans and actions can be measured for size and adequacy.

What can we determine about the college and university of 20 years from now, say, 1985? We can be reasonably certain that, in the future, institutions of higher learning will be profoundly influenced by (1) the rapidity of change and (2) a computer technology with major applications to higher education. What are some of the other probabilities?

Enrollments will increase dramatically, from over 5 million in 1965 to over 13 million by 1985. The reasons for this increase include the exploding population, greater attention to education beyond high school, and an accelerating need for adult re-education.

These expanding enrollments will lead to more institutions in the king-size bracket, many more new institutions, and, concurrently, an even greater variety among colleges and universities. Some will achieve a relatively homogeneous student population; others will develop a diversity even greater than they now have, particularly in the range of students' ages and purposes.

The explosion of knowledge will reach almost overwhelming proportions, with the twin-headed problem of retrieving and utilizing the volumes of information becoming available to us through a mounting flood of publications. One estimate is that as many as 40,000 pages of articles in technical journals now appear annually from the world's presses. I was amazed when I learned that major libraries in this country are now doubling their book collections every 12 to 16 years, or fewer in some cases.

The inevitable consequence of this situation will be the use of computers and a variety of technological equipment for accumulating and using information. The large lecture as a method of instruction will be gradually abandoned, so that, at long last, the teacher's talents will be utilized to full advantage in working directly with small groups of students who have already gathered factual information by mechanical means. The new equipment will enable students to tap informational resources at almost any point in the country.

For example, regional informational centers may be developed in the future, available to anyone with access to the proper equipment. Already, books in Boston are being reproduced experimentally in New York. The consolidated library at Johns Hopkins includes the university's computing center on a basement level, presumably in realistic anticipation of close interrelationships. At the University of Florida, students who are enrolled and participate in certain graduate engineering courses are physically located in Daytona Beach, Orlando, and Cape Kennedy. For housing units of the future, probable equipment will include teaching machines, reading accelerators, and teaching stations connected with the institution's information center.

In my opinion, major components of the future college and university will be: (1) an information center with computer equipment for sorting and disseminating course materials; (2) living-learning centers where, for extended periods of time, students live, study, and meet with their teachers in individual conferences and small group seminars; (3) study centers for students who commute daily or remain on campus for limited periods of time; and (4) broadcasting centers which will organize and distribute study materials for enrolled students who do not come to the campus at all. These study centers, incidentally, are likely to be future versions of our college unions.

Marked change can be forecast for the curriculum and teaching methods of the future, not only because of the explosion of knowledge and the new technology, but especially because of rapid changes in the world of work. It has been reported, and my figures are approximations, that as many as 30 per cent of today's jobs will no longer exist 15 to 20 years from now. Such a possibility gives sobering emphasis to someone's comment that today's colleges and universities are educating students for a world that does not exist. Such a possibility points to the urgency of new curricula which will adequately help students to learn and to grow into more mature persons capable of living effectively in a world characterized by change.

A thorough-going reorganization of colleges and universities is long overdue. Within institutions, we can look forward to assignments of responsibility that cut across departmental and disciplinary lines as we now know them and to the development of organizational patterns that encourage unity of action. The residential college, currently under development at the Santa Cruz campus of the University of California, illustrates an organizational plan which incorporates student housing as an integral part of the academic program. Among groups of geographically related institutions, we can expect the formation of regional associations to gain realistic economies through the sharing of personnel, resources, and facilities. Examples of the possibilities include common research projects concerned with improvements in building design, and joint planning staffs operating on a continuing basis.

Rounding out the list of probabilities for the future is the steady rise in our standards of living, with the national wealth spread among greater numbers of people, and the average annual salary reaching $15,000 before the year 2000. (Parenthetically, I should note that the economists report, however, that we shall still have as much trouble then as now in getting our income to equal our expenditures!) At the same time, for those of us concerned with physical facilities, the clear message is that we must consistently upgrade our standards. A telephone in every student room is now widely regarded as standard equipment. Once viewed as a luxury, air-conditioning is now listed as a necessity.

Most colleges and universities have grown accustomed to turning away students for lack of space, to the extent that they assume any kind or condition of housing will be gratefully accepted. The compulsory room and board plans have tended to dull the sensitivity of food service managers to student preferences. But students of today are more discriminating than were those of yesterday; and those of tomorrow will be more so. The residence hall built only five years ago may be almost out of date, and plans for renovating and refurbishing are essential. In the cafeteria-dining room, clever merchandising of food products will be more successful than compulsory board in maintaining revenues and insuring balanced diets. Contrary to the customary current practice, I am firmly convinced that education should come in an attractive package, and that the physical facilities of the future must all meet the reasonable expectations of students and their parents who, by the way, will also be expected to pay the full bill.

With these probabilities in mind, we can better visualize factors affecting the future college and university within which college housing will function as centers for living and learning, centers for the development of small student communities, and centers for student personnel services. As centers for living and learning, college housing will physically be a combination of residential, instructional, and food service facilities.

A successful example is to be found at Michigan State University. A typical hall, or center, accommodates about 600 men and 600 women assigned separately to two residential wings. Connected to these wings is a central core which typically contains food services, 4 to 8 classrooms, 2 laboratories, 15 to 20 faculty offices, a library, and lecture hall. Such a center is one of a complex of 3, for a total of about 3,600 students. The Michigan State Centers either have rooms for two students each, with a connecting bath, or suites with two sleeping areas, a study area, and private bath.

Program goals for living-learning centers are: to help students find personal meaning in their learning experience; to facilitate access to the academic life; to maintain high standards for student productivity; and to contribute to the mental as well as the social, physical, and moral growth of each student.

As centers for the development of small student communities, college housing has the objective of helping to create and maintain dynamic living groups which enhance the conditions for learning and strengthen the sense of common effort. Factors which seem to have a bearing on the formation of such communities include small size, physical identity, common interests and values, and positive leadership. Of particular importance may be our room assignment programs which help to get the right students together, and our orientation programs which set the tone for group work and living. Equally important is providing appropriate models for incoming students, through our student leaders and housing staff.

As centers for student personnel services, college housing provides exceptional opportunities for helping students. There are two major reasons: (1) students tend to be themselves where they live, so that staff can work easily with and for them in many ways, and (2) students tend to take advantage of services that are readily available within natural traffic patterns. As one example, the English Department's writing clinics held in Indiana University's living centers appear to attract more students than the clinics scheduled at the main office.

Over the next 20 years, student housing will be used more and more as an integral part of the educational process, initially because of economic reasons which will require the most efficient possible use of college buildings and sources of revenue. Additionally, we can anticipate from research more and more evidence of the values of housing for student learning. Future housing units will be designed to organize students into comprehensible living communities where each individual counts as a person, and where team learning fosters a sense of intellectual excitement and accomplishment. Group living will be used as part of the curriculum to teach human behavior, values, and relationships.

Let me make it clear at this point that college housing as learning centers exists principally as an objective at the present time, even though some notable examples can be found and some of the future prospects I have described are very close to reality. Nevertheless, for higher education's future success, this objective is one of those that is vital and essential, not just desirable.

The use of college housing as integral educational facilities is a result of three fundamental assumptions which are seldom disputed. First, environment influences behavior. The housing structure creates a visible physical environment which can have potent physiological and psychological effects. Take, for example, the insufficient illumination, the undersized study desk, and the ill-fitting study chair which drive the student away from his intentions to study. Structure also gives form to a social environment which can establish significant controls over individual conduct. When the student group decides that studying is not important, some of the group members find it difficult to adopt another point of view.

The second assumption is that enrichment of the environment enhances intellectual activity. Since the physical and social environments stimulate student behavior, the quality of these environments is likely to influence the quality of student response. The theory is that a culturally impoverished environment will produce individuals lacking in cultural interests, and most of the residence halls on our campuses provide evidence in support of this theory. I should add that there is limited but exciting evidence from research with secondary school students to indicate that enrichment of the environment helps to improve intellectual effort.

The third assumption is that learning is a total process, by no means limited to the classroom. A number of factors seem to influence learning. One is the opportunity to explore ideas so that they take on personal meaning. Another is informal and comfortable association with others having similar interests. And a third is student readiness. Often overlooked is the fact that the student himself operates as a total organism, not a disembodied mind. If he is unprepared emotionally or physically to hear what a teacher has to say, the chances are he will not hear, much less learn. Ths housing staff not only help in identifying and removing road-blocks to learning but also in encouraging students as they search for meaning in the college world of ideas.

There are problems to be solved as we move toward our objective of developing college housing as effective learning centers. A primary one is the recognition of change, along with a willingness to change, on the part of faculty and administrators and perhaps even architects. Yet fundamental change is occurring on the contemporary campus at an accelerating rate, and failure to prepare for change can only expose the college needlessly to grave operational difficulties.

Student housing is a good example. Where residence units are designed and operated along traditional control patterns, they are failing to meet student needs and becoming a serious hazard to the academic life, partly because of inept operating procedures. How unfortunate, when basically the same residence units could be planned for the use in fostering a sense of wholeness in the educational experience of undergraduate students.

A second problem comes from administrative confusion concerning housing programs, by which I mean planned activities that insure progress toward the goals set for housing. Some administrators feel that the new building itself will produce the desired results so that no programs are necessary; others believe that all activities in housing should be student-initiated, so that little of consequence occurs. By far the most common programs are social and recreational in nature, and many of these need to be re-examined for current usefulness. Some are concerned with cultural enrichment and information-giving, and their success depends upon their relevancy to student interests and coursework.

A third and closely related problem is uncertainty over the kind of staff to be selected for residence units, and the assignment of staff functions. Certainly the requirements have changed greatly in recent years. Staff members must now be capable of working with students of superior intellectual ability and generally high social competence. At the same time, today's students reflect all of the complexities of contemporary society. The large housing organizations with important interrelationships on and off the campus now require competent staff with a variety of abilities and skills, of which teaching is one. In the future, distinctions between housing staff and classroom teachers are likely to diminish and disappear.

The fourth and last problem I want to mention is planning which produces buildings with little or no reference to operational objectives, programs, or staff. Sometimes the fault lies with the administrators who cannot reach agreement on these matters; sometimes blame can be placed on the architect who claims that available funds are insufficient to build a residence which will serve educational as well as shelter functions. When such a claim is made, we may find that the real problems are limited understanding of housing's educational functions, inadequate information on construction methods and materials, or a short supply of educated imagination. On the other hand, the real problem may indeed be funds that are insufficient because the institutional planners did not properly assess project requirements.

Successful planning depends upon adequate time and accurate information. Adequate time requires that planning be used as a continuous process by both small and large institutions, so that up-to-date basic information, and perhaps preliminary plans, will be available for a specific construction project whenever its financing has been arranged. Such a procedure will cut planning time requirements substantially and speed up the building's delivery date.

Information for planning involves the future of the college or university in terms of enrollment, curriculum, and teaching methods; trends and new ideas in the use of building materials and construction methods; and research results which can be used to improve the design and use of student housing units.

One potentially productive source of information about building materials and construction methods is the work already done in California on secondary school construction systems, together with a building system program to be undertaken for student housing for the University of California. The basic purpose is to achieve minimum costs through repetitive construction components that can be mass produced.

Recently, I read the summary of a study concerned with freshman men living in six-man suites. This study made three interesting points: (1) entering students have needs for affiliation and needs for achievement; (2) the conditions at the institution created conflicts between these needs to the disadvantage of some students; and (3) the development of more opportunities for students to learn together and for students and faculty to learn together might solve some existing conflicts. We might ask ourselves: How can student housing be used to enlarge these learning opportunities?

Another question which has interested me for some time is this: How can we design residential facilities so that they are clearly identifiable as part of an educational institution? The vital ingredient for planning here is educated imagination which can analyze the various possibilities and apply the results to a housing design that symbolizes and energizes its educational role. Such a design will reflect the best of the past and, at the same time, anticipate the future, with close attention to the physical and social requirements of students at work in an educational setting.

For example, comfort in student living may really mean environmental stability rather than ease and comfort, leading to somewhat different emphases in the design of student rooms and their equipment. The result of imaginative planning should be new and renovated housing facilities truly appropriate to institutions of higher learning.

As planners of buildings and curricula jointly look to the future--and this combination is essential and inevitable--many will discover that housing units can be utilized as vital centers of student learning, for several reasons.

First, in order to relieve classroom faculty from the routine of information-giving, an expanding array of technological equipment will be available and much can be located where students live. Eventually, the faculty will also generally meet with students where they live.

Second, as more responsibility is placed on students for their own learning, greater attention will be given to the environment for learning--buildings which enlarge opportunities for students and faculty to know each other as persons and to discuss ideas in an informal setting. Housing units will serve these purposes well.

And, third, the search for maximum operating economy will lead to the conclusion that certain combinations of residential-instructional facilities have distinct financial as well as educational advantages.

The trend of the future seems to be toward living centers which provide superior learning opportunities for students. In the case of small colleges, the campus as a whole will be organized as a learning center. On the other hand, large universities will consist of varying numbers of these centers, each one operationally semi-autonomous.

Two major design patterns will probably be followed to meet the differing requirements of the single student population. For lower division students, the typical pattern is likely to be suites for 6 to 8 in centers which provide space for an extensive program of group activities, educational, social, and recreational. For upper division and graduate students, suites for 2 to 4 with a kitchenette added will be planned in centers designed to emphasize freedom of action, sense of privacy, and small group activities.

The development of student housing as a positive educational force in the campus will have a tremendous impact on the effectiveness of colleges and universities in this country. Crucial to this development will be the dedicated work of top-flight planners who are sensitive to the fact that in their hands lies the success or failure of thousands upon thousands of the most capable and talented youth of this country.

COLLEGE-OWNED AND PRIVATELY FINANCED STUDENT HOUSING

Paul J. Doebel

I. Magnitude Of The Student Housing Problem

American colleges and universities which enrolled almost 6,000,000 degree-credit students in 1965 can expect to enroll more than 8,500,000 by 1975. To the extent that the increased number of students enrolling in this period are housed in residential institutions, the job of providing student housing will require the financing and construction of perhaps as much as $6,000,000,000 of new student housing. It is well, therefore, that we give some thought to the issues that will have to be resolved by each institution confronted with a portion of this job. Efforts to get the maximum good from an investment in housing facilities and to minimize board and room costs to students can easily be thwarted by a less than optimum financing plan or by a less than optimum division between the institution's efforts and those of private developers.

II. Factors To Be Considered

Factors that must be given consideration in determining the role that the institution and the private developer can and should play in providing student housing, and the financing plan that should be employed by the institution in constructing its own housing are as follows:

A. What are to be the functions of such housing? That is, what are the objectives that the institution wants to achieve through its housing program?

B. What are the preferences and needs of the student body and what costs can they afford?

C. What are the financial and financing resources of the institution?

D. What is private enterprise capable of doing and what are the advantages and disadvantages of its participation in the student housing program?

I shall now deal with each of these factors in more detail.

III. Functions And Objectives For Student Housing

Before an institution can give any consideration to its financing plan or to the role that it wants private developers to play in the development of student housing, the purposes of student residential facilities must be clearly defined. These purposes or objectives may be stated in the following broad terms:

A. One institution might state that its objective is one of merely providing the barest essentials of food and shelter for their student population.

B. Another's might be one of providing everything that the student desires and can afford--ample and well-furnished rooms and dining facilities, numerous recreation facilities and areas affording ample opportunity for social and cultural programs.

C. Still another could be that of providing facilities at a cost level that the average student budget can afford; that is, one of providing an average standard of living accommodation plus a limited amount of recreation, social and cultural space.

D. Or possibly it might be that of providing a healthy and adequate, but not plush, standard of living accommodation and a maximum of space for educational and cultural programming.

E. Some might state a combination of some or all of these.

Obviously, these goals cannot be established without some concurrent consideration of the financial concerns because financial limitations may require altering these goals. Nevertheless, the establishment of these goals is necessary in order to give proper direction and perspective to all the other considerations which are largely implemen[illegible] in nature.

IV. Student Preferences and Economics

While the factor of student preferences and economic means is so obvious that it needs no elaboration, it needs to be mentioned here because of its extreme importance in the development of the student housing program. Suffice to say, however, student needs and preferences are as many and varied as are their economic means. Consequently, the institution's objectives, building programs and financing plans will have to be just as numerous and varied.

V. The Institution's Financial and Financing Resources

It should be quite obvious, at this point, that an institution with limited financing capabilities and resources and a student body of equally limited means might have to alter the initial objectives and composition of its housing program. Thus, considerable attention must be given at this point to the matter of financial and financing resources of institutions and then later, to the role that private enterprise might play in assisting an institution in achieving its housing objectives.

What are an institution's financial resources and what is the importance of each?

A. The Institution's Credit Rating. A sound and well-established credit rating is, perhaps, one of the greatest assets that an institution about to embark on a building and financing program can hope to have. If an institution has any intention of borrowing a sizeable sum of money at reasonable interest rates, it should give a great deal of attention and long-range planning to the development of its credit rating. In order to establish such a rating, it is not only necessary to have a history of a sound financial condition, but to publicize or sell this fact to the people in the money markets. Let us look at some of the steps necessary to develop a good and well-known credit rating.

(1) The institution must develop and maintain a high standard of financial management. It must have a record of meeting all its financial obligations.

(2) It must maintain professionally acceptable accounting procedures and reporting methods. Accounting reports which can be relied upon by credit analysts are essential if the institution hopes to assure creditors of its financial stability and integrity.

(3) It is highly desirable to hold informative meetings with representatives of institutional lending firms and investment bankers. The more these people know about your campus, your institution, your housing and your plans, the more interested they will be in investing in your future and the more willing they will be to consider you a low risk.

(4) If you have bonds outstanding and your record of payment on them is good, and if you have features in your financing plan which limit the risk to potential investors, you should make an effort to have your issues rated by a major investment advisory service such as Standard & Poor's Corporation or Moody's Investors Service, Inc.

(5) You can improve the rating of a particular loan or bond issue by pledging the full or limited faith and credit of the institution in support of the bond issue. This can be done in part by pledging student fees and tuition as a guarantee to the fulfillment of the loan obligation.

(6) Your credit rating will obviously be greatly improved if you are able to obtain legislation (assuming that yours is a state institution) which will permit pledging the full faith and credit of the State to housing bond issues.

(7) A credit rating is favorably influenced if an institution is able to demonstrate that its structures are soundly built and well maintained. Potential investors are more inclined to look favorably upon projects of which they themselves can feel proud and which they feel will have a useful economic life well beyond the period in which they will be financially involved.

B. Abundance of Institutionally Owned Land. Land already owned by the institution is a financial resource in that it helps considerably to minimize initial capital requirements of a housing project. The contribution of land is in part an investment which the institution will fully recover and in part a subsidy. It is recoverable as an investment because land does not depreciate and can be used again and again after the initial structures are razed. It is a subsidy to the extent that, from a commercial point of view at least, the institution is deprived of a return on its cash investment in the land which it might otherwise realize.

Available land cannot only be used by the institution for housing which it constructs, but it can also be leased to private developers for the construction of housing which they would finance and operate or lease back to the institution for operation.

C. Uncommitted Net Revenue From Existing Housing and Food Service Facilities.

A number of institutions have a financial asset in the form of unencumbered income from facilities which are now debt free. Such income may be sufficient to support a large part of the principal and interest payments on a new facility or to at least provide the additional coverage required on the debt service. Such additional incomes help further by making a bond issue more attractive to potential buyers, thus reducing the effective interest cost.

D. Availability of Gifts, Grants and Endowments.

Gifts, grants and endowment funds, which are more often available to private than public institutions, minimize both the amount of capital that has to be borrowed and the annual debt service payments required from rental income.

These sources of capital funds need further development, particularly for the financing of low-cost cooperative or other types of work-sharing housing units. It would appear that a strong appeal can be made to philanthropists for their assistance in lowering housing costs for the financially needy who are willing to help themselves by participating in a work-sharing plan. Also such funds can be used to great advantage as loan guarantee funds which serve to lower interest costs for loans thus supported or as a debt service reserve established to meet the requirement of most revenue bonds that a reserve be established equal to the interest and principal payments for two years.

E. State Appropriations.

Obviously, if capital funds are readily available from the state, the questions of who is to provide the housing and the how of financing are simple ones. In requesting such funds, it can be argued that student housing is a necessary adjunct to the academic program and if the latter must be supported publicly in order to make it available to citizens of average or little means, then so must be the housing. However, it is quite unlikely that, with all the pressing needs for state tax dollars, state money to support housing construction can be made available without reducing the availability of funds for the construction of academic facilities and for expanding academic programs.

F. Year-Round Utilization of the Housing Plant.

Year-round utilization of the housing facilities, whether in support of a year-round academic program or a large summer conference program, can help the institution minimize its financing problems. The extra income resulting from this high usage may be employed to meet a high debt service cost and thereby lower room and board charges to students.

G. Tax Exemption Status.

Tax exemption status on loans of public institutions is one of the most valuable financing assets available to public institutions. This status, which can lower annual net interest costs materially, and exemption from property taxes probably do more to aid an institution in lowering its housing costs to students than anything else short of direct support from the state. These two assets, plus freedom from pressure to operate at a profit, are the major edges that an institution has over private enterprise in minimizing student living costs.

H. Subsidies From Institutional Operating Funds.

If an institution has sufficient general operating funds, it may wish to depend on such funds to subsidize housing operations by absorbing the cost of utilities, overhead and maintenance. Such subsidies allow a greater portion of the housing operating income to go toward debt retirement. In terms of accounting, it is better, perhaps, to provide direct subsidies from the institution's general funds than to absorb these costs. With the direct subsidy approach, an institution has better knowledge of its actual costs and is in a better position to present more factual information in its financing literature.

I. Federal Loan Programs.

One of the greatest financing resources for all institutions, both public and private, is the availability of two Federal loan programs. These programs are a particular blessing to those institutions with a sound financial plan but with no established accesses to normal money markets. These programs are:

A. The College Housing Program administered by the Housing and Home Finance Agency. Under this program, institutions are currently eligible for loans bearing three percent interest which can be amortized over a fifty-year period. At the present time, each institution is limited to $4,000,000 annually and must give evidence that it can provide a 1.25 coverage on their debt service.

B. Title II, Section 221 (d) (3) Loan Program administered by the Federal Housing Administration. This program is designed to finance the construction or rehabilitation of multi-family rental housing for low and moderate income families. Occupancy priorities must be given to those displaced by urban renewal or other government action. Southern Illinois University, I understand, and perhaps others, have been able to obtain a waiver of this last requirement. The loan to Southern Illinois University was granted at three percent with a forty-year amortization period and a debt service coverage requirement of only 1.0.

VI. Private Enterprise - Capabilities, Advantages and Disadvantages

Private enterprise can participate in the housing program in one of two major ways:

A. It can finance and construct that housing which is needed by the institution and lease it to the institution. C.I.T. Educational Building, Inc., a subsidiary of C.I.T. Financial Corp., is one of several private concerns which offers such a plan. Under its lease-back plan, the company finances and constructs buildings on land owned by the institution and leases them back to the institution for a period of twelve years at approximately $250 per student per year. To such costs, the institution must add its own costs of operating these facilities. At the end of the lease period, the Company will have fully amortized the cost of the buildings and the buildings then become the property of the institution. Such plans have the advantage of freeing a college from worries over financing and construction matters. They are particularly advantageous to institutions having few financing and financial resources and little experience with housing construction. Such plans are not without disadvantages, however. Frequently, the low costs and short amortization periods are realized through a less than optimum standard of construction which may not meet applicable building codes and which may be subject to costly maintenance and repair work. Also the short amortization period may require charging higher rental rates than most students can afford.

There is, on the other hand, an argument in favor of employing less costly and less permanent types of construction. Changes in the composition of an institution's enrollment and changes in the housing needs and preferences of students dictate that a housing program be extremely flexible. One means of achieving this flexibility is through the construction of shorter-life structures which can be razed without financial loss to the institution and replaced with housing of the types then needed. The difficulty with such a program, however, is that even in the last few years that the structure is occupied, reasonable standards of repair must be maintained and this can be quite costly and psychologically difficult. No one likes the idea of pouring money into a structure scheduled to be razed in a year or two. Furthermore, with space shortages the normal situation, few institutions find it easy to tear down even the less permanent structures. Consequently, an institution may well find itself investing more money in the long run in maintenance and repair than might have been required initially in terms of capital outlays for a more permanent type of construction.

B. Private entrepreneurs can finance, construct and operate student housing completely independent of any participation by the institution. The number of firms willing to operate on this basis is growing, and on this campus they include Tishman Realty, Towne Realty and a few local entrepreneurs. The institution can have considerable or little control over such housing depending on its inclination and particularly on the nature of its housing regulations.

If the institution permits its students to live wherever they choose, with few or no restrictions, the real influence of the institution over such housing is almost nil. The likelihood that the entrepreneur will develop housing and operate it in harmony with the institution's goals depends not only on the developer's ability to accurately assess the market in terms of "what kinds of housing will sell" but also on his willingness to share the institution's objectives. Based on my observations, I would say that there are a number of firms that are willing to cooperate fully with institutions on this matter, but there are also a number who look on student housing ventures as purely business transactions packed with opportunity to realize profits.

Looking at the matter from the private investor's point of view, we have to recognize that he is careful about lending money for privately operated residence halls because of the following aspects of the venture:

(1) A building designed for students, and in most instances located where there are few other potential users, cannot easily be diverted to other uses.

(2) The institution has authority to establish regulations pertaining to where students may live. The climate for a private residence hall operation could become quite unfavorable should an institution suddenly decide to require all its students to live in its own housing. (It should be noted that many institutions have an obligation, as a result of previous financing commitments, to adopt whatever housing regulations might be necessary to assure an occupancy level sufficient to generate enough income to meet the loan obligations. Private developers interested in constructing housing on campuses where such commitments have been made should be alerted to them, so that they can accurately assess the inherent risks.)

Where an institution, because of its liberal housing regulations, is not in a position to exercise control over the private developer, the following problems may be encountered:

(1) The number of units constructed may far exceed the demand should the private developer fail to accurately appraise the market and should he disregard the growth projections and housing plans of the institution.

When this occurs, political and other pressures may be exerted on the institution to alter its own educational and growth plans or to share housing vacancies with the private developer so as to minimize the private investor's losses.

(2) The private housing facilities may be ill-fitted and furnished and the recreational and cultural features which contribute to the educational processes may be greatly neglected.

(3) The institution may lose complete control of student life in these facilities with the result that the student's out-of-class education is neglected.

The following is a quote from the summary of a discussion titled "Experience With Construction and Operation of Residence Halls by Private Investors" conducted at the 1964 meeting of the Association of College and University Housing Officers:

> "As a basic premise, the statement, 'Off-campus housing at any University is in direct competition with the University,' may be supported by the following comparisons:
>
> Quantity of housing - It is in the best interest of the university to supply housing for all who request it and to provide a wide variety of types of housing; it is in the best interest of private enterprise to limit the supply of housing to guarantee full occupancy and to vary its housing little.
>
> Price - It is in the best interest of the university to provide the lowest possible price in housing; private enterprise is interested in the highest return on its investment.
>
> Quality - It is in the best interest of the university to provide safe, comfortable, and convenient housing which includes recreational areas; private housing often runs from marginal to bad or else is sumptuously elegant.
>
> Function - It is in the best interest of the university to provide housing which complements the educational processes, which is not always the aim of private enterprise.
>
> The panel discussion concluded with the following suggestions: the private investor must understand that he is providing housing at his own risk; the university officials should know what they want and must settle for nothing less; the university should retain control of private housing especially in regard to educational and recreational facilities and services available; housing officials must realize many problems can arise from off-campus housing that is in direct competition with the university."

In spite of the concerns mentioned here, private housing has and undoubtedly will continue to fill a definite need for some institutions; and it can be beneficial to students, the institution and the investor if the private investor and the University cooperate in the construction of the building and its operational aspects.

VII. Conclusions

Efforts to meet the housing needs of an institution's growing enrollment must start with the development of some rather concrete ideas as to the functions such housing should serve. The objectives that an institution establishes for its housing program should be consistent with its overall educational objectives, and these objectives should take into account the preferences, needs and economic means of its students. The objectives may have to be altered somewhat by limitations in the institution's financial and financing resources. If an institution wants to have complete control over its entire housing program, it is essential that it carry out the program on its own rather than have private enterprise do so. In order to maintain complete control, the institution must develop its financing and financial resources to the fullest extent possible. It has many avenues of financing. These include the following:

A. The sale of bonds. These may be housing revenue bonds, mortgage bonds or a combination of the two. They may be bonds which pledge the resources of the institution as well as the income from the project. They may be bonds which pledge the general resources of the state, municipality, or other political subdivision as well as the income from the project and the resources of the institution. These bonds may be sold to the Housing and Home Finance Agency of the Federal Government or to the Federal Housing Agency, or they may be placed privately with a large financial institution, or they may be sold publicly.

B. Loans from banks or other financial institutions. Such loans are usually limited, however, to those of shorter durations.

C. State appropriations or gifts, grants and endowments.

D. A combination of any of these.

To the extent that the institution's financial and financing resources are not adequate, including those made available by the Federal Government, the institution might want to consider leasing housing units from private financiers and developers, in spite of the disadvantages, in order to be able to at least control the day-to-day operations and effect those educational and guidance programs desired by the institution.

Larger institutions which must serve a diversity of student needs and which have a system of regulating where students live sufficient to effect some control over private housing developments and operations might well want to consider a combination of university-owned and operated facilities and privately constructed and operated facilities. The institution could provide those accommodations required to meet the needs of the student of average economic means and leave to the private developer the construction of the more luxurious facilities and perhaps those other special types of housing which the institution might find difficult to finance or justify to its governing board and the public.

The rather obvious problem is one for which there is no common solution; that is, one of finding the proper balance between the University's basic objectives, the needs, preferences, and economic means of its students, its own economic means and financing resources, and a role for the private entrepreneurs. Just as each institution has its own unique combination of objectives, needs and resources, so will it necessarily have its own unique solutions.

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NOT JUST BEDS

Norman Fletcher

It is a pleasure for me to be here with you architects, university administrators and various other people connected with the college housing program. I did have a lot of fun and confusion last night coming in on the plane, but I am sure the University of Illinois is going to take care of these things much better in the future. I am going to carry a special package with me in the future that doesn't involve a suitcase.

It gives me great pleasure to be here to get a chance to exchange views with you on college housing. I finally figured out a title for my talk last week and I called it "Not Just Beds" to indicate my concern for quality beds rather than just more and more beds. I am afraid I have also indicated to my program planners, Mr. Brightbill and Mr. Smith, at this point how out of tune with the times I am by not giving them a copy of this talk beforehand. I am learning the hard way that today's world depends on pre-planning to such an extent that we can expect history will demonstrate not the survival of the fittest but the survival of the pre-planners. One example of this is during the construction process where months ahead of the time when the architect can actually see the size of the space he is dealing with, he is asked to decide on all the paint colors, the tile colors, and the scheme of finishes for the building. Another example is the planning of our great conventions in architecture where cities and sites are set up three to five years ahead of time. Still another example is the story of how Winston Churchill, long before his death, wrote out a scenario for the ride of his sepulchral barge down the Thames, and President Johnson only slightly tipped his hand when announcing the attack on a North Vietnamese port an hour before it actually happened. And so goes the survival of the pre-planners.

"Not Just Beds"--in some ways I feel that I am not throwing down the gauntlet in the quest for quality, but that people are already accepting that quest and that they are asking how best to achieve it. I can talk at length about the great need for housing students and the pressure of the population explosion. It seems to me this argument leads to the primary goal of quantity. More and more beds--fast, cheap and efficient. As a friend of mine said who is a building project coordinator with a great corporation and engaged in a quasi-package deal operation--quick, mean and nasty. There may be a place for the purely efficient operation, but more and more colleges are taking seriously the problem of building buildings for hard use that will be there to look at for thirty or forty years and perhaps more. After all, they will only pay off the mortgage in thirty or forty years, and that's when they really want to start to live. We have just remodeled dormitories in the old Harvard Yard built between 1800 and 1890 and, believe me, they are still going strong. My impression of the university client is very definitely that he has a desire to upgrade his whole physical plant. He is often knowledgeable about planners and architects and insists on the master plan as a context within which to work before proceeding on the building. He is interested in the landscape and the spaces between buildings which the architect tells him are important, and he is very interested in the material for the building.

Materials and the attitude toward them are changing. When formerly asphalt tile and the glazed tile syndrome were acceptable, now one is finding that a good grade of vinyl asbestos or even cork are much superior for reasons of long-term maintenance, for lessening of impact noise and for better appearance. Carpeting for corridors and even throughout for rooms is being used widely because of its sound-deadening properties and its low-maintenance factors. Natural materials such as redwood or oak vertical siding are being introduced to bring in warmth and flexibility to rooms. Brick is being newly discovered as an interior material--low on maintenance and pleasant to the eye. Furnishings and furniture design have been through their growing-up period in modern design, and we are now producing many handsome serviceable items such as the Charles Eames contract storage wall unit. The old days of the lightly constructed furniture which can be thrown around and which wouldn't last ten minutes are over, and many good American and imported items are available and are being used. Most of these can be had at competitive prices and are being adopted more and more by our colleges.

Recently, for example, we had the experience of recommending a wide use of butcher board tables--solid maple 1 3/4" thick, for a dormitory complex which included all the dining tables as well. On hearing that a formica fake-wood finish was being proposed as a substitute, one of the Trustees, a lady on the building committee, told the Vice President to let her know when this subject came up again so that she could kill it in no uncertain terms. Her approach was to let the students have the opportunity to become acquainted with the look, feel and quality of natural wood.

Not only in materials are dormitories and college housing changing, but also the whole approach to the social order and their concepts as to the housing and the educational pattern is being given more thought. The whole attitude is one of producing better housing and a better environment for the student. Recent histories of high school design serve as historical prototypes in that as better schools have been built, they often paid more attention to the problem of scale, and the breakdown of the huge educational factory into units or clusters of units of classrooms which served as a more sympathetic environment for the young student. The problem of feeding large numbers of students was handled in some cases by satellite kitchens which had their economic aspects, since they could utilize a large central kitchen. The schools provided decentralized dining rooms which served as a more human social grouping for the student body in a large high school complex. So, too, in college housing design, we are beginning to react against the quasi-efficient dormitory plan with miles of rooms double-loaded on both sides of a corridor and a great commons building with a huge dining hall serving over 500 in one large room. We are beginning to realize that what we produced earlier was more like a prison than a home. The time, indeed, is right for new thinking in the housing of a student. While all of us continually face the problems of budget and none of us is free from this, we have a responsibility to keep this requirement in proper balance, in proper perspective with the ultimate educational goals in mind. I think we all feel the hot breath of history down our necks. We know that if we don't do well for the next generation, we will be roundly cursed for it. In fact, we have the uncomfortable awareness that if we don't look far ahead fast enough, it won't be the next generation that curses us but the entering class of 1970. The times are moving fast. Your competition is not your next-door neighbor, but the college or university 2,000 or maybe 3,000 miles away.

We, that is, The Architects Collaborative, have had the privilege of working together with Pietro Belluschi recently on an undergraduate housing program for MIT. In the program of that new housing, certain goals were set forward which, to my mind, were among the most inspiring of any that I have yet come across. I think you will be interested to hear what they are. I won't quote them completely, since Mr. Riker has already enunciated the idea of education as part of the housing goal, but I think a couple of the comments are interesting. Mr. Vannevar Bush said at the MIT Centennial, "The training which equipped men for the world a generation ago will not suffice today. Yet how can we train for the world of tomorrow if we cannot know what sort of world it will be? It will still be inhabited by men who will struggle with their environment and with their fellows. We cannot go wrong if we impart a deep understanding of both." And then he goes on to say, "To create an environment in which this education may indeed grow and flourish," Dr. Bush suggests, "clearly requires more from the university than providing beds for those who need them." And Dr. Killian said in his dedication for Baker House at MIT, "We want to develop an environment at MIT that performs in the broadest sense an educational function itself, not in a passive way but in a dynamic way. The whole complex of living conditions, activities, and atmosphere must be skillfully arranged to provide the kind of environment that contributes to the development of leadership, breadth and standards of taste and judgment among our students."

In the attempt to achieve these goals, MIT has emphasized two main factors. One of them is diversity. MIT seems to like the idea of different kinds of housing. They feel that if some of the students would rather live in apartments rather than dormitories, that's fine. They feel that if, by necessity, some students would rather live in remodeled rooms or in older dormitories, they may, in fact, find this to their liking.

It certainly has been true, in my experience, that not everyone likes the new dorms which the modern architects have created, and surprisingly enough, some students even prefer the larger rooms and taller ceilings of the old dorms. MIT reflects this attitude in the new college housing approach. They have told their architects to provide spaces of differing character in their various houses. They have entries for groups of students from 20, up to 42. They want outlooks for the student rooms up the river, down the river, out on the playing field and they want students' rooms which vary in size and shape. They, in fact, are trying to avoid, like a plague, any idea that the whole complex is a monotonous repetition of similar experiences.

The other important idea which is being imparted in this program is the idea of faculty involvement. This idea proceeds on different levels and begins with the notion of the entry of 30 or 40 students related to a tutor who is a graduate student. The tutor's apartment is planned next to the common room which is adjacent to the stairway of the entry, and he is expected to provide mature guidance in academic, extra-curricular and personal interests. The location of the tutor near the entrance makes him available for bull sessions and the give-and-take with the students in the entry. Then MIT has the idea of a house master. The house master is a senior man with a family, is expected to be there quite a few years, and is one who can command a great deal of respect as well as prestige. He is to be a kind of philosophic head carrying the major share of working with the student government and other staff within the house but not as a proctor or merely a Mr. Chips. He has not been charged with specific duties, but it is expected that he will search for the formation of a specific character of his particular house. MIT hopes, in addition, to involve the faculty for visiting seminars and for periodic lunches with students. They also have accommodations for two or three apartments for visiting fellow student programs.

It can be seen from this series of aims, if you will, that there is a wide scope of activities indicated, very far from the traditional idea of dormitories. What they are trying to create, in fact, is something like old English system of Oxford and Cambridge, the idea of a house.

One of the most important ideas in the search to give character to the dormitories or house has been the suite idea. This has taken different forms. Intriguing here is the search to discover what are the right groupings of students? How many students make the best social groupings, and how many should be related to the lounge or entry areas? I have observed this debate at different levels starting with what is the right number of students around a dining room table. One of my partners has defended staunchly that eight was the ultimate number. I have also heard six is ideal, but what about the man who just wants to eat by himself. Do we have to have brilliant conversations every day? Maybe he wants just to retire and not be involved in a brilliant conversation. Then there is the question of the three-man dorm room. No! Never! This is usually verboten, and yet I find some of my friends' sons getting along perfectly fine in a three-man dorm room, so maybe this can even work on occasion. One example at Clark University is worthwhile mentioning. Groups of 16 students are planned around a vertical stair entry. It is three floors high and involves a total of 48 to 50 men clustered around a stair hall entry with a small lounge and reception at the ground level. In the MIT example, we have six to ten men in single rooms around a stairway making a total of the entry of 24 to 42. In addition, the suite on each floor has a small living room with a kitchenette. In a suite, it is thought that a student can get acquainted in some depth with the six or eight men who are closely related to him; and he can develop respect for the intellectual and cultural differences among them. Small kitchenettes can serve to encourage conversations and bull sessions at that level. A large common room for 30 to 40 men at the lower floor serves the whole entry.

Interestingly enough, some of the recent designs which we have developed, as well as other architects, have called for an integration--horizontally as well as vertically. We are finding that although originally inspired by some of the old houses at Harvard and Yale organized around a stairway, the problems of exit and service have compelled an integration horizontally as well as vertically. This has been borne out by the fact that we find students making friends lengthwise down the hall as well as vertically around the stairs. So we are responding to this in providing both opportunities. Again, this is the need for greater choice of action, and greater flexibility.

And now just a few words about the room design. The study bedroom cubicle must be successful if the dormitory is to be any good at all. It must be big enough to take the man's equipment or two men's equipment and clothes. It must be big enough to take 1,000 other things as well. Everything is getting larger and more numerous. Clothes are multiplying; there is never enough hanging space; and particularly I find girls' sweaters are multiplying. We are always short on space for girls' sweaters. They have dozens of them. Equipment is growing, ski equipment, hi-fi equipment, athletic equipment of all kinds, off-season equipment. Beds are getting bigger. Strangely enough, everybody is growing taller. MIT now says that their average man is so big that they need a 7' x 3'6" bed. I don't know what the 3'6"--they must be getting fatter as well. Book storage, hi-fi, and all the million other things compete for wall space. The book storage requirement on the wall now for MIT is 50 linear feet per man. Now where do they get all the money to buy that many paperbacks or books? With this impossible request, we are attempting to design a flexible storage wall. We are doing this by providing a wood-siding wall with a recessed adjustable library track spaced 2'8" o.c. This will give them all kinds of shelving 6" to 18" deep. It will give them drawers as well as the possibility of putting the hi-fi on the wall.

MIT has emphasized flexibility and diversity in room design, suite design, and in the design of the houses generally. Of the four houses that we are master planning for them, they want no two major entrances to be alike. They are asking for a hierarchy of exterior spaces which will not only provide a great common space where a man can feel a part of the larger house, but related small spaces where small groups of men can gather. They feel that a related series of exterior spaces together with a building well disposed on a site will avoid the feeling of left-over exterior wasteland and create a composition which will point up and heighten the drama of the interior. They feel that the provision of different levels, the use of transitional changes in grade, and the careful planning of paving and planting will give a variety of different court spaces and enhance the character and identity of the house. Yes, times have changed a good deal over the last fifteen years. The old L-shaped dorm with the double-loaded corridor is out, and the articulated medieval fortress is in. The flat square-cut-out window is out, and the deeply penetrating splayed exploration in the wall is in.

The quest for quality is here with a vengeance. Sometimes it is hard for the architect to keep up with a client's wish to give full freedom of expression and full flexibility within any reasonable budget. Sometimes neither budget nor client can keep up with the architect's desire to articulate a structure and space until the whole place is jumping with a Bossa Nova beat. No longer are we designing long Kafka-like corridors, endless and harshly lighted. Rather, we design interior circulation with so many ins and outs that the students need a road map to find their way around in it. Lounges are no longer hard-surfaced, uncomfortable left-over spaces with pictures fastened to the wall, but soft, warm, comfortable conversation pits with wall-to-wall carpeting. Fireplaces are de rigueur and original prints, paintings and tapestries are not unusual. The outside expression of the buildings has changed, and now we have clear expressions of the exterior of each entry and even in some cases, each room is expressed and in one case I know of, every desk unit is expressed. How articulate can you get? But all joking aside, our clients are demanding better plans from better programs and we, the architects, are responding to that challenge; yet, we still have a long way to go in terms of providing proper scale for student housing and of providing appropriate and gracious ways of handling the dining and social functions of living.

STUDENT HOUSING AS A COMMUNITY

Gyo Obata

Everyone here knows the physical problems colleges and universities have experienced in the last 5 to 10 years as accelerated growth has been forced on academic communities. Many administrators now see they have been thinking in terms that are too small and shallow to solve their problems effectively.

Housing is but one aspect of the total college or university community. Before considering the problems of housing alone, I think it is important to consider its relationship to the whole.

Alert college administrators have developed master plans showing the nature and location of future academic, housing, athletic, and recreational facilities. In other words, planners are setting the future direction in expansion of building. When done well, these plans have been very valuable in ordering growth and correcting past deficiencies.

However, even where a Master Plan exists, the architect's usual procedure for housing is to work out designs to a program for a designated number of students on the designated plot of ground. The result is usually a distinct new building group, probably reflecting what is newest in housing types.

Whatever the merits of the particular design, I find myself increasingly concerned that much student housing is not integrated into the total institutional community. The housing needs are, too often, considered simply in terms of providing beds and cafeteria seats. But, if the students are to gain the broad enrichment that all universities should wish them to have...housing will have to be planned to provide the type, diversity and character of facilities needed to make this fulfillment possible.

Planning will, in large measure, determine the success of the college's entire educational program. The institutions wish to attract the best possible students and teachers. These people...the heart of a fine academic community... can afford to be selective about the college they choose. They are looking for associations with other good students and teachers, for good facilities and for a pleasant place to live.

Good planning can provide for all these desires. It will create facilities and conditions that will attract top scholars. It will enrich the entire academic experience for everyone on campus.

With this in mind, let me talk somewhat abstractly about the needs for which housing should provide. A careful examination and understanding of the needs is a first step in the development of a valid solution--whatever the project may be.

In approaching an understanding of total housing needs, I believe it is fundamental to begin by thinking in terms of the individual's needs.

First of all, the student has certain basic needs that have to be satisfied on a strictly individual basis. These include sleeping, study and storage of clothes, books and the rest of the paraphernalia.

Secondly, the student has needs--still personal needs--that can well be satisfied on a small group basis. Here, we may include washing and other sanitary facilities. We must also provide room for lounging and intimate conversation--the sort of give-and-take that enriches the college experience.

Thirdly, the student has needs that usually may be satisfied on a large group basis. These are needs for dining, recreation, socializing or meeting. Service facilities and special instructional facilities should also be planned. These are needs that from the standpoint of use and economics, as well as the interpersonal development of the individual, should be satisfied on a large group basis.

This describes an ascending order of needs, generally. In every actual project, it is essential to review the needs and establish the importance of each. Then, it is necessary to decide on the kinds of facilities that will serve these needs, based on the relationships and combinations that are most meaningful to a particular institution. The considerations of a technical institution would certainly differ from the interests of a music college. This is programming, and this is where both the academic people and the architects have been falling down.

Do not make the mistake that one formula will do it for a large number of students. Students, like all other people, come in different sizes and sexes, and with different abilities, motivations, and interests. There is no reason, in the large project, not to "slice the pie" different ways--to have variety not for itself, but to reflect the needs of different students.

When the requirements have been really mulled over, then the type and character of the spaces to provide for these needs can be worked out. I don't say it is easy to arrive at what is the most suitable in a particular case, but at least a direction has been set.

For each category of needs, certain kinds of spaces are appropriate--the individual's room for sleeping, study and storage; a living room, rest room, showers, and so on, for small group needs; dining rooms, meeting rooms, etc., for large group needs.

Unfortunately, many design solutions for these needs are too stereotyped. The solutions fail to come to grips with the undeniable fact that various colleges have different requirements. One solution or type of solution may work well at college "A" but fail completely at University "B."

What we must do, I believe, is approach each project by trying to create a combination of spaces of different character that will be the most meaningful.

Considering these spaces as separate events is not the whole architectural or educational solution.

Here, it is well to look to what visually constitutes a successful community. It is not the monumentality or cleverness of the separate facades of the buildings. It is not the glorification of separate parts of a town. Rather, it is in the combining of all the parts into a whole--a whole that has continuity and variety; quiet at one place, active and busy at another. A real community has a sequence of spaces interrelated, indoors and outdoors. Each space is indicative not only of its particular function, but of the fact that it is only a part of a whole. A community is, then, a series of places; places for people doing different things at different times.

Charles Moore, discussing monumental architecture in California in the Yale architectural magazine Perspecta makes some very perceptive points about what sort of public spaces people use and respond to. He talks of the older Santa Barbara Civic Center which he considers successful. He says it has "an orchestration of spaces varied and complete enough to evoke a complex public use." In discussing the City Halls of San Francisco and Los Angeles, Moore points out that they fail to form a "place" that elicits public participation. For some time now, architects have been analyzing such past examples as the Italian hill towns, Greek island villages, Machu Picchu, a ruined city of the Inca civilization, and other old communities. Really, we are looking at these places, envious of what was achieved by previous societies. These towns illustrate the point that a real human community can only be achieved when each building, each unit, does not stand in isolation. In these communities, there is a visual continuity of different places and masses reflecting varied needs, importance and use. Now, as formerly, we need to have places that evoke a full range of human experience. This is true whether we are planning a city or a student housing community.

We will begin with a group of slides to illustrate the various needs within the problems of a residential college community. We begin with the various needs; the individual needs, the basic needs for smaller groups, basic shared needs of what some colleges call the housing or primary group, the secondary group, and finally the common shared needs for the entire complex. The individual needs of sleeping, studying, storage, and basic shared needs within smaller groups.

Now to the second primary and secondary--the little bit larger groups where recreational facilities, washing, laundry, large living areas, discussion areas, and finally the larger common shared areas combining large outdoor spaces. Now translating these needs into space needs, again we begin with the individual spaces, small shared spaces, the larger shared spaces and the common shared spaces.

The individual room, the single room, with areas for studying, sleeping, storage. The shared double room--the 12' x 16' which has been used a great deal. Then clustering the basic individual needs around the small shared needs with small living area, toilets, shower. Then clustering of the smaller shared needs around a little larger shared needs. Grouping of these various units to form a house from 15 to 150 on to the total complex with the red being the common facilities. The spatial order cluster, the house, the larger group, to the total complex.

Now in the design of any of these facilities--group, research, planning, design--all these needs are brought into a community field house.

These are some of the examples that we have done within the last ten years. This is a small women's college, the Missouri Christian College. Initially, we began about eight years ago to find a three-level dormitory and then three years ago, we completed a lounge and a dining hall.

This shows the individual areas--the green, the shared needs in yellow, and some of the larger shared needs in the orange. Essentially, it was a vertical house with areas of the shared needs in the center with sleeping areas above and below. The entry is in the mid-level with some of the living rooms, recreation areas, on those levels and upstairs; there are a series of vertical stairs, here, here and here, with rooms upstairs and downstairs. This shows there was a bathroom between two units with storage area there, a bathroom here, study areas. This is looking from the dining hall towards the three-level dormitory. Looking from the dormitory, there is a sunken garden to the lower level and then the dining hall. This shows the shared areas are in the center with rooms upstairs and below.

This shows one of the typing rooms--a study desk. This is the plan of the dining room, the kitchen located here. This is a small enough college that they wanted all the girls, about 350, to dine together in one room. They have the possibility of closing off certain sections when there are fewer people dining there, so there are essentially three spaces all together in one room. There are lounges and entry areas through there.

The exterior is essentially concrete and brick, some outdoor terraces. This is one of the interior lounges going into the dining room. The dining area is carpeted, and it is all table service. This is one of the display units where the students show some of their projects.

This was quite a different problem for the University of Missouri--a much larger university of 16,000 students and a complex of approximately 500 students with one unit for boys and the other unit for the girls with common lounge facilities and dining areas located in the center. Entry for the boys here and entry for the girls here. Gardens along here and parking in the back.

This shows they divided their house unit horizontally into each floor where individual rooms are located with some common living rooms, study areas in the center, more common shared room downstairs and then dining facilities in the center between the two units.

This shows a typical dormitory unit with living and study areas in the center. The common facilities (the dining room) are located here with the kitchen in the back. This is on a split level at this point where the students can go down into the lounge and come up through the four stairways directly into the line and then into the dining room, so they can be sitting rather than getting into a line. It's essentially a concrete reinforced structure with a brick skin. This is one of the units, and here are the other units with dining facilities on the second level with a sunken garden and lounges on the lower level. Living rooms are on the corner. There are living rooms here by the dining hall.

This is one of the entries directly into the lobbies going into the dormitory in this direction and to the dining hall and the lounges on the other way. The planting was not finished yet, but there was an outdoor garden on the lower level to this area.

This was a typical room. All the rooms are essentially dull rooms with a study area, sleeping area. This is not a college housing project, but one that is just now being finished. It is still in construction, and is a community for older citizens going up on the bluffs of the Mississippi River overlooking metropolitan St. Louis, In the center, there will be another cluster of units directly above this point. There are dining facilities, little shops, laundry and places they can buy things they need, and a chapel. It is all interconnected by corridors or through these various gardens to efficiency one-bedroom and two-bedroom units. In the center is a small higher building of five stories. Here, the individual areas are in the green again with some shared needs along the corridors, the more common shared needs under the tall building and in the common facilities. These are the basic units--bathrooms. This is an efficiency unit--a one-bedroom unit here.

This shows an aerial view of the dining facilities, the shopping area, the chapel and various units with the high-rise view. This is the dining area located near the chapel and these interconnected corridors in the various units.

This high-rise building is a bearing wall building with brick interior partitions. Slabs are poured on the bearing walls. This shows somewhat (not too well) that it will be filled with gardens and palms, etc.

This was one of the quarters that was made up of some units that were shown. It is all part of it.

This is Washington University in St. Louis and the major academic area located at this point. They had a forty-acre site across the way and below a master plan for this area. This is the recreational field. There is an underground pedestrian connection from the main campus over to the residential community. This site was filled with these beautiful oak trees, and we had been working on this site for approximately ten years. Initially, we began it with some vertical houses and then we went to clusters, clusters, of six-man suites located here, and then we now have completed two high-rise buildings just recently. The dining area was initially planned for half, and then it was recently completed above the dining room on the other side. Eventually (this doesn't show too well on the slide), this whole area is the lower section with higher ground being found in this area. This will be formed into a lake which will tie the units together.

This shows a high-rise building, vertical housing and dining. This is the area that will become a lake--the high-rise, vertical house are C plans.

Our problem here was to save as many trees as possible. The initial buildings were placed on small podia, so that we would not disturb the land and began the units at that point.

The vertical house has the the individual roofs on the upper three levels with some shared facilities on the entry level. Washington University, at one time when we were working on the plan, had the idea of possibly adding fraternity living areas to the two end units. So we went to the vertical unit with a central stairway for each unit--they are completely cut off from each other at these points, the living room, proctoring room, kitchenette, etc. on the ground level and bedrooms up above. This is the floor with the common shared facilities and the living room. The bedrooms are upstairs. These were some of the level rooms.

This is a suite plan for the individual rooms--there are four suites to a floor--two singles and two doubles and a living room and a bathroom. On the bottom level, there are three clusters always together and in one lower level is a library. Another is meeting rooms and another has recreation room facilities. This shows a typical unit with a single here, a single here, a double, double, bathroom and a living room. It is a very compact scissored stair. We are trying to do these units for cost just a little above the regular dormitory price.

This is a perspective showing a living room, the shower and bath, single room, single room, a double. This shows three of the clusters forming a paved court. These are the lower areas where there are recreation areas and a library meeting room.

Some of the paved outdoor spaces are out of the recreational areas. These are the little balconies off each living room. We gave the students a great deal of freedom to furnish--just a few pieces of furniture were provided, and most of these suites they decorated themselves. It worked out well for the graduate students and the upper classmen, but not so well for the lower level interim students.

This is again a photograph of another room that was furnished. This is one of the single rooms. The rooms themselves were much smaller because we wanted to put more space within this limited budget into the living area.

Then this last group of slides shows the high-rise unit plan with every two floors having approximately 50 students forming a small house unit grouped around a two-story living room. There are five of these living rooms and the elevator stopped on the living room floors. Then you can go half-level up and half-level down to the individual rooms. On the lowest level are the largest shared facilities. There is a library, meeting rooms, and recreational areas. This is a typical floor with a living room being located here. The elevators also land there--having five stops rather than ten stops makes the operation a lot more efficient although half of them go up or down to single rooms and double rooms here and along here. There are some common study areas in the center and, of course, above us. This is one of the lower levels--there are two levels here. These are lounges, small libraries, some meeting facilities, the main library. Outdoor activities are off these levels. This shows the points where the elevators stop and here is a little window seat in each room. This shows the two levels of the common shared areas.

This shows the single room--a variation of the two double rooms. These are the two little windows. The air-conditioning unit is within the seat also. This is one of the rooms. In one of the high-rise buildings, we used Charlie Eams' storage units that Norman was talking about--this desk unit, storage unit, desk unit. This is a window seat. This is the lounge on the first level.

The dining facilities in the center are essentially glassed in a room which can be divided, and on the lower level are more lounge and meeting facilities.

THE INDIVIDUAL IN COLLEGE HOUSING

Fred Bassetti

As colleges become universities and universities grow into multiversities, individual students have become blurred into one anonymous group. They have come in such masses that their identity can only be established by IBM cards. In their first years, there is little opportunity to talk to the senior faculty. They are taught in masses, they are housed and fed in masses, and they riot in masses. But they should not think en masse. Since the purpose of society is, ultimately, to benefit the individual, something must be done to bring back the sense of individual worth, to convince each student that his education and welfare are the ultimate goals. If this can be done as soon as he enters college, his attitude toward the whole teaching process will be radically different from what it would be had he been treated indifferently.

It is true that freshman classes are too large to allow more than nominal discourse between teacher and student, and that only the accomplished scholar or troublemaker meets the Dean or President in his first few years. What, then, can be done to convince the beginner that he counts, to give him a sense of place? Where can action be taken? I feel it can be taken most readily and effectively in the housing-feeding program.

Such a program is ideal for this purpose because it is the student's first and most intimate contact with the school. As soon as he is registered, he moves into a building that will be his home for at least a year. Depending on whether that building's plan is considerate or neglectful of individuals, its architectural scale is intimate or gross, its detailing and use of materials is sensitive or haphazard, its landscaping is generous or sparse, it will support or help to destroy the student's loyalty to his college and its educational goals.

But before design problems can be solved, there must be a definition of social goals, a study of people. Ironically, a college with large sociology and psychology departments can't seem to manage this study. So it is up to the architect. He and his assistants visit the campus and interview students at random or circulate questionnaires in an attempt to find out how students live in college housing and how well they like it. Housing and food committees are quizzed too, but usually all that is discovered is that walls don't stop sound or that one roommate's study lamp disturbs another's sleep.

What needs to be discovered is sociological in nature; what are the best groupings for student living? Should eating facilities be in small or large halls? What is a reasonable balance between low-cost mass feeding in cafeterias and intimate dining halls, where certain meals are served at table? Should there be a mix of housing and teaching facilities, or is it proper that classrooms and dormitories be in wholly separate areas?

Our experience suggests some tentative answers, but one needs to look at them with a skeptical eye, since they are mostly intuitive. This experience begins with a group of college dormitories at Bellingham, Washington. It reaches ten years back in time and 400 miles distant to a current set of plans for another college at Ellensburg, Washington.

This Bellingham development for 400 students shows our first hesitant attempts to break down mass housing into smaller, more intimate groups. The basic "social" unit is a pair of students to one room--two people who must come to know one another. The next larger group varies between 10 and 18 people who meet each other shaving in the same bathroom. From here, the next division is an entire floor level of about 40 students who use a small game room and study lounge. There is one more meaningful grouping of about 125 students to a building. Beyond that, the relation is more tenuous to the project as a whole, 400 individuals, more or less; the place where they eat which serves 1,200; and then the entire college of about 6,000.

We still don't know what effects these social units of increasing size will have on the student, but they may be similar to a child's feeling of security and place when he relates himself to family, neighborhood, classroom, school, city and nation. A sense of scale and right proportion flows from such social divisions and their interpretation in three dimensions, but it is absent if a person must make the enormous leap from singleness directly to total population.

Each of these social divisions must manifest itself in the building plan. It is not enough to build ten stories, paint each floor a different color, and call it a house. There should be a natural diversity clearly understandable to the occupants. Anything else will be sensed as "phoney."

Scale is one of our most important tools in designing a healthy environment for any living group, but no single design element can be neglected if the maximum effect is sought. A proper use of materials can support the effort. Brick, wood, stone and carefully detailed concrete seem natural and appropriate to college building, while plastic, aluminum, rusty steel and excessive amounts of glass do not. This is at least partly because the more natural materials weather gracefully. They improve with age as do human beings who have lived long, useful lives. Don't most of us prefer the old college buildings to the new?

It may seem obvious to mention how important landscaping is, but our experience has been that college business managers would prefer to use money remaining in the construction fund to start debt service rather than to spend it on growies. When planting, other than grass, is finally done, many seasons' growth have often been lost. I, for one, think that no dollar serves the college better than that one which is spent on trees. When you think of Harvard, do you think of their program in comparative literature or of the Yard and its wonderful trees?

These design elements--scale, building and site planning, choice of materials, detailing and landscaping well done--are necessary to the success of any project. But there is another side of architectural design that should be considered. It is rarely discussed today; but for that very reason, because it's not "camp," it is the more worthy of discussion; it is "architectural character." But what is character? Is it important? What is or should be the character of college buildings, particularly housing and dining facilities?

There is a split among designers. Some praise Mies's buildings, holding that the "Ice crystal of the Wise" represents the final answer. Others point to Rudolph's and Kahn's recent designs and say that external form, though bizarre, suggestive or photogenic is the way. These are countered by some--not many, among younger architects--who support a titillation of surface effect as demonstrated by many examples from Yamasaki's and Ed Stone's work.

And there are some very serious ones who point to the new architecture building at Berkeley as representing the true faith.

All of these directions have some validity, but all fall short of achieving right character because all neglect something of nature's reasonable path, while most seem concerned with aesthetics first, people second.

No one can say for sure what "right character" is for any building, but might it not be found through a willingness to listen? So often we architects are arrogant and impose our esoteric preconceptions on the defenseless building user. If we would let each building problem have its say, if we would listen with a sympathetic ear and mind, if we would respond willingly to the peculiar nature of every problem, we might do as well as the farmers with their barns, or the spiders with their webs.

I have seen student dormitories shaped as pure cubes; I have seen them made of candy frosting; and I have seen them of indestructible concrete--for all the world like a prison, except for the large sheets of glass unprotected against the sun and prying eyes.

It is obvious that I think the character of such projects is wrong. I think the students sense that it is wrong too. What, then, is right? I believe what is right comes from finding good physiological and psychological architectural answers to student needs.

The buildings must have a look of permanence and dignity--they should represent a lasting tradition of seriousness in education. But they should not look stodgy, because dull teaching is no teaching at all.

Petty annoyances and frustrations should be eliminated--lights that shine in eyes--noise--the distractions of jarring color or material or form--too much or too little heat that can't be controlled--beds that are too short--desks too small--storage too stingy. The direct result of careful study of all these minor elements is the achievement of a comfortable mood that students will respond to.

Eliminate sharp corners everywhere, use natural wood edges with well-rounded corners on desk tops instead of self-edging with formica; specify cloth or parchment-shaded lamps instead of metal bullets, or, even worse, fluorescent tubes; put in an old-fashioned oak captain's chair with its honest wire bracing instead of a plastic Eames chair. Force the building committee to let you put in carpeting instead of asphalt tile. And, not least important, make the rooms different from one another without forcing unnatural variety.

Do all these things and the students will give you "Hero 1st Class." They won't quite know why, but they will sense in their bones what you have done. On the other hand, honor awards may not fall your way for this since juries rarely see below the surface. Your reward will be in heaven, and the fact that an intelligent Board of Trustees will give you another job. Yet you can accomplish all this and still have a place to go before you rest.

What remains is to so order the whole development that a natural range of student living needs is met, not forgetting dining and activities after school hours. The time is past when different architects can be called on in successive years to design unrelated projects, or when mass eateries for thousands at the lowest possible price is a reasonable answer. The Director of Food Service will say that students can't afford more than 45 cents for lunch, but it's not true. In a co-educational dormitory group we have done on one campus, there is a room, commandeered by the students, called the "binocular room." Hooks are screwed into the wall and on the hooks are 28 binoculars. One day a freshman in his skivvies took down his glasses to look across the court. He found that the object of his attention had her binoculars trained on him! He dropped to the floor and crawled out of the room. They can afford what they want.

Small dining rooms are somewhat more costly to operate than large ones, the specialists say. But why must all the help be hired? Wouldn't it be healthy to rotate chores such as waiting on table and clean up? And anyway, if a brick building costs more than a tent, it may also serve its purpose better.

Having at least one meal a day served at a table with a cloth in a civilized, relatively intimate environment helps to civilize the students and build a feeling of solidarity. This is clearly evident in the Greek letter houses, and it might be a useful tool to help those students who so often remain socially adrift all their college years. We must remember that the average student doesn't have the highly cohesive peer group we architects had when we were in school.

As to the need for variety in accommodations, we should not forget that the youngsters in most schools come from all walks of life. Some are forced to observe the very stringest economy, while the mass, of course, has a moderate flexibility in money matters. And some have cash at all times.

Freshmen and sophomores have subtly different needs from upper-classmen, while married students, with and without babies, differ again.

A few like to live alone and can afford it; for most a double room seems to be best, but there are always some who can manage in threes or fours. Some would like monastic cells--others, bohemian apartments with kitchens and balconies.

And in addition to all this need for diversity, there is the problem of how to add a pinch of seasoning to the housing-eating mix by bringing in some cultural or academic activities for the off-hours. This must be done in a form that the students will not resist, indeed must be made to seem so natural that they will initiate these activities themselves.

Maybe we should provide space for a coffeehouse, a small outdoor arena theatre, an area that can be flooded for ice skating, a branch of the college bookstore, a seminar room, a place for controversial speakers. These would help fill out the bones of a skeletal housing development. But another still more informal area should be provided--a turbulence chamber, a place where almost the whole population rubs shoulders, where boy meets girl and ape meets intellectual and sophomore baits graduate student, and where, occasionally, even the President or Dean might wander with possible gain to both themselves and students.

So these are some of the things that might be done, but they are only a hesitant start. The problem is one of ordering society in microcosm; yet, the fact that it is a small segment doesn't make it less complex. And if an architect does attempt to put some or all these suggestions into three dimensions, he shouldn't expect praise. Most likely he will be blamed because not all will be successful. But there is another and greater reward. It is that the experience, trying to understand the nature of and to plan for one small segment of society limited in area and time, may give him insight into the greater problem of how to plan our cities, a problem that is pressing beyond measure and challenging beyond the dreams of ambition.

PANEL SUMMATION

Mr. Haase--And now we come to what I feel is perhaps the most important part of today's meeting and the next couple of days' meetings: that is the chance for you to get back at the speakers, so to speak, and ask them questions about your own private problems. You will get a chance to hear some expert and excellent advice or opinions on problems you have been scratching your heads about in your own offices. It is a particular pleasure for me to get involved in these. I have, in the last couple of years in a small way. These conferences that the University of Illinois are having on Architecture and the College are of considerable interest to the group I'm with in New York, Educational Facilities Laboratories, and to me, as it should be to all architects. I was quite encouraged to hear Mr. Bassetti this afternoon refer to his relationships and the growing concern on the part of the architectural profession in becoming involved with different sorts of people for us--anthropologists, sociologists, psychologists--and really trying to understand how people react to the environment in which they work and live. The major message of these conferences at the University of Illinois, I believe, is that the college environment is made up of places as well as people and that both are considerable influences on the students' attitude and behavior.

I have taken the questions that come from you and tried to organize them into three groups or topic areas which will sort of bridge some of the things we have been talking about today.

First of all, I would like to take those questions that are related to the room or the suite or whatever it might be referred to, and how it best fits into a kind of social hierarchy of spaces in the dormitory, in the student housing and what the possibilities are of going beyond the cell block kind of dormitories we see all too often. The only focal point may be the gang toilet down the hall where everybody gets together once a day for exercise and togetherness. It appears from what we have seen and heard both this morning and this afternoon that there are alternatives to this approach--a chance to get away from what has been referred to as a kind of "cooky-cutter" sort of dormitory environment, each room just like the other. In an attempt to try to please everyone, we are pleasing no one. Now I will take the questions that come from you on this particular subject of the room or the environment (social) within the dormitory. I have tried to get Mr. Bodis' questions up early in this discussion since he has indicated he is trying to make transportation connections, but let me take one here from Mr. Fletcher first.

Mr. Fletcher, if you care to say, what type of fee arrangements existed between your firm and MIT to permit you to do the extensive research that you have done on the housing project? And another question comes along these same lines--does your office have an unusual fee structure for the design of residences? Would you want to comment on that?

Mr. Fletcher--Obviously, they do if they are building a new building. In relation to the MIT project, it is not an unusual fee arrangement, but it is an arrangement in which there was an adequate compensation for master plan studies of the whole site which has in it a clause for partial credit for the work on the first house or the first two houses. Other than that, there is no particularly different arrangement. Actually, the way our firm works and I think other firms as well is that our approach is very much a probing one. I, personally, think most of my partners find that the full-blown division of the beautiful piece of poetry hardly ever becomes full—blown all at once. The division, if we ever get it, is something that has been probed and searched for and dug out as far as we can dig it out. In that process, we stand to do a lot of work. It seems there is a lot of trial and error, and so I think maybe that is it.

Mr. Haase--Mr. Obata, a couple of questions come to you on the dormitories you showed us this afternoon. One of them relates to cost, and I am going to throw that in here too. Questions come as to what size of room has been established for a single or a double and which have you found is preferable, the single or the double, and then if you could, comment on the cost that you have estimated for student housing and perhaps how that was actually realized in the actual cost of the project.

Mr. Obata--I would like to make just one comment about the fees. I think that if the client or the owner really wants quality and character in his residential housing, the fee is the smallest part for what you give, and I think if you get a serious architect, like we three here, you get a whale of a lot of studies. I think that there is no standard size or solution. I think that was one of the points all three of us are trying to make; I don't think there is any kind of standard unit for double room or single room. I think, if it's possible within the budget, etc., we would prefer to have many different shapes and sizes of rooms. At Washington University, we have both singles and doubles. In the suite plan, in order to save costs, to put the spaces into the living room within the six-man suite, we made the single rooms very small. They were only about 8' by 12' or so, and the double rooms were 12' by 16'; the students did have very small rooms, but they had more space to go into in the living room. At the University of Missouri, we went to mostly double rooms because of the problem of budget.

Could we discuss the fees before we get off that? I think that a fee is really a minor amount in the expenditure, whether it is 6%, 7% or 8%. I would like to do a little statistical survey right now, if I could. I would like a show of hands if anybody gets more than 8% in college dormitories. Does anybody get 8%? Anybody get 7%? There is one who gets 7%. There are a few more. Anybody get 6%? I didn't see your hand go up, Norm. What grade are you in? 7-8. There is a fellow back there with his hand up with four fingers. Anybody with less than 6%? We have been working with 6% generally in Seattle and find that we really aren't making ends meet unless the project is quite large. Of course, we do quite a lot of research like you have to do. It is a straight 6% for all work no matter how large or how small. Well, in our case, it is a graded situation in which the fee varies according to the size of the project. That's the way it should be.

That was an interesting point that Mr. Obata brought up about a serious architect. There are some around, and he has indicated that we have at least three here today who will spend a good deal of time programming, researching and trying to analyze a problem for the client and not just quickly jumping into preliminary drawings that may duplicate something they did last year for another client in another state. One of the questions now goes to Mr. Bassetti which will be an interesting one, I think, because he was earlier trying to think how the panel might somehow bug the environment here for Walter Netsch tomorrow. He has a chance here with a question.

Your talk emphasized the element of scale and its influence on the individual. Please comment on the Chicago Circle Campus in this regard.

Mr. Bassetti--I'm not familiar enough with the Chicago Circle Campus to comment. I did hear a comment, and that prompted my discussion with Mr. Fletcher earlier. Somebody said that they completely forgot about people there. I don't know if Netsch is here or not, but I hear he is extremely articulate and it would be great to have needling of a little bit beforehand, so that he can field the ball very well. I really can't comment. I have seen it only briefly from a taxi and some things I thought were terrific, but I really could not comment.

It's really an unfair question, and perhaps we can have another conversation over cocktails about it.

Mr. Haase--For Mr. Fletcher. How do you propose to make movements among groups of three floors in your skip-stop tower at MIT?

Mr. Fletcher--It is set up so that communication between floors is no different than in the other buildings. To communicate with the other floors is not difficult. It's just that the elevators plan to stop every third floor at the main entry point, on the same principle really as an apartment house scheme. It is designed in this case for the entry system. I don't know if that answers the question or not.

There is another question in this same area, but I think perhaps you did answer that after the question was written. You mentioned horizontal group relationships but in the MIT solution, this did not show up. Was there a reason?

Mr. Fletcher--The plans were pretty hard to read at the upper floor level, but they do connect with a door connection between suites. In the first part projects, the suites were connected by the washrooms for service so that you can get, in the case of fire, from one building to the other. This, they thought, could be improved by by-passing the floor into the corridor. The style at Yale works that way as well and in the new quadrangle we have redesigned the washrooms so that you can by-pass and connect with a door from one end of the building to the other, so that really from one end of the building to the other are a set of doors that you would pass through--swinging doors--to get from one end to the other--this enable people if they want to and in this case they did. They have had some student meetings and the students said, "Well, we don't want to go outside like the old Harvard houses but on the entry from the outside to the dining room; in fact, we want to go down the corridor to the dining room." So they can. They can go from one end to the other by a series of connecting doors down a main stairway to the dining room, and thus get their desire to connect the dining room.

Mr. Haase--Mr. Bassetti, someone asked you why you say that architects have become too arrogant. It probably doesn't relate too much to the topic area, but I wanted to get this question in here.

Mr. Bassetti--Actually it does. I think it's a good topic of discussion. I have had many discussions with students on this in the past. I remember a group of bright young fellows from Columbia who took me to task a couple of years ago on that. I was supporting the idea of willingness and being willing to respond and feel the conditions and take into consideration the feelings of the people who use the buildings, and the students were telling me that no great architect was ever responsive. He was arrogant. You had to be arrogant like Frank Lloyd Wright to be a good architect. While I recognized the mood, I think, and it prevails among kids at that age, I still feel that in the early days before Frank Lloyd Wright became overwhelmingly arrogant, his work was greater than it was toward the end. Eldo, for instance, whose work I admire perhaps as much as any of the great names today is not an arrogant person. He is a very strong person, and I think the students were confusing arrogance with strength because arrogance does not necessarily mean strength nor does humility mean weakness. Einstein was an extremely humble person and yet an extremely strong one at the same time. I think an architect should be strong, but not arrogant. He should be willing to listen and respond to the conditions. I think that I am very much disillusioned with examples of Meis' work, whereas ten years ago, I was a tremendous admirer of his work. I am still an admirer of him as a person because of what he has contributed. He is certainly one of our great architects, but I don't believe he has learned. I don't think he has progressed since 1923 when he did that magnificent tower all in glass or since 1927 or 28 in the Barcelona Pavilion. I think he reached a peak then which has not been gone beyond. I think it is left for other architects such as Eldo and those others whom we know are doing more human work today. I don't know why this is--maybe it's arrogance in Meis. Groves, Fletcher's partner, is a man of enormous strength and at the same time a genuinely humble person, and I think his contribution will last beyond some of the others.

Mr. Haase--Do any of the other architects or the architects on the panel want to respond to that question?

I sympathized with everything he said. The only thing is if we rule out the arrogance of the architects you mentioned, we rule out half or two-thirds of the great creative work that has been done or we say, "They can be arrogant but we can't." It is sort of like Yamasaki saying that "What I'm trying to do is create the light" and what we are trying to do or somebody else is trying to do is chaos. We all want the privilege to create great architecture, and I don't know where we draw the line. I think it's a very deep question of when we search modesty, when we stop trying to be creative. I don't know. I think it is a difficult thing.

I like that word "humility" that was used in the talk. I think there is a great strength and a real humility.

Mr. Haase--Since you mentioned Frank Lloyd Wright, I think probably looking back on his life as you did, he had at one time made the statement that he had early in life chosen between honest arrogance and hypocritical humility. I guess he left up to the reader which one he chose.

Maybe there is another way. Maybe you can have honest humility as Einstein did. Really I think it's a question of semantics. I don't think there is any disagreement. I think it's a question of how you view the word. I certainly believe that an architect has to be a very strong person to be a fine architect.

I think to point this question in another direction that the need is not for outstanding single works of architecture, but one could build up the case that many architects spend a good deal of time emphasizing the grounds of the environment which are in large measure due to chaos resulting from individual uncoordinated effort rather than a kind of sympathy with one's environment in singing the song that somebody else began or sing with them. I think this is part of Fred's idea of humility. I think that, in a way, we should find some idea of trying to find a way of contributing to the overall environment as opposed to the great individual work of art and the willingness to live with that. Mr. Obata, do you want to comment on this?

Mr. Obata--I think some of our great masters did come through at a time when they had to act arrogant in a sense to fight the tremendous obstacles placed against them. I think we have gone through this stage now, and we are in a state where there is much better communication between our society and the architect. I find our clients are much more aware and sensitive towards quality inherent.

Mr. Haase--I don't know if this is related to the question of arrogance, but something came up in a number of your presentations today, the slides, and a few references to Charles Eames which had to do with, I think, at least a sort of arrogance. It says, "This is what a storage wall should be, if we can use that as an object," and lately in our office we keep hearing people talk about storage walls being no good. Who wants to build in something in a student's dormitory room? You've got to somehow appreciate the differences among students who are going to be using that room, differences in age, differences in sex, differences in interests certainly, and the need to stamp some sort of individual attitude on the room in which they are living. Can you do that with the sort of things that Charles Eames might design for our dormitory rooms--the storage wall that did appear in almost all of your own projects? Is a storage wall something that we can be concerned with?

I think that's a very good product, and some things have to be standard, you know. We all wear shoes. I think the storage part is one thing you can make standard without trampling on the student.

I think that Eames' storage wall is a very good product. The hardware is good, and it is well made. It is well ventilated. It makes sense economically. The only trouble I found is to make it really work you need a lot of wall space. But even so, I think it is a fine product.

Mr. Haase--Maybe we can get a reaction from Walter Netsch on that point because right now he is planning to develop some new dormitory furniture for Northwestern University in conjunction with Charles Eames. One of their goals is to try to develop modular components which will still have the style and the quality of manufacturing construction and design that exists in Eames' products now, but would also permit some degree of flexibility. I hate to use that word, but convertibility, versatility anyway in a way in which the student can adjust the room to fit his own needs. On the question of size of room, I must mention one more point. The eight-foot room, it seems to me, is a kind of limiting factor. We just built the mark-up of one of the MIT rooms with all the materials, brick and everything else, and I mentioned the bed size as being seven feet long. If you have a room that is 8', you have a bed that is 7', you limit the flexibility of the room arrangement severely. If you cut down the bed length to 6'10", it is actually a big help and if you had a 8'6" room, you would start getting the possibility of putting the bed sidewise to the room or across the room. It gives you about three more options in furniture placement. The bed is critical in the flexibility of the furniture placement in the room and if you don't have the extra six inches, you can't walk around the end of the bed. You limit the arrangement of the room to a length-wise arrangement with the bed, but I think that six inches there is very critical.

Mr. Riker, Mr. Bassetti was talking about fraternity houses and the social environment within them as opposed to what has often been fairly stereotyped design in dormitory housing. The question would come to you from the same point. What is your hope for fraternities and sororities? Is this something you would want to comment on?

Mr. Riker--Well, I certainly appreciate what was said with reference to fraternities. This question arises from something that was said last evening actually, in which I expressed the grave concern about the future of fraternities and sororities on the college and university campus. I expressed this concern for several reasons. There are so many changes coming about on the college campus that I think are bringing change on the fraternity and sorority picture. One of them is the fact of size. Another is the fact of increased academic requirements. The students just don't have as much time to devote to their own business of running a house. I can give you just a few examples. For example, on our own campus, there seems to be trend toward getting some adults part time to handle the business mechanics of the fraternity and sorority. Then, of course, there are other social factors involved. I think in some of the northeastern states that the fraternity is pretty much on the way out on some campuses with reference to questions of discrimination, etc. Yet, I do want to say that I think that the fraternity as a social group with the strong sense of loyalty has a very vital place, a part to play, on the campus, just as soon as the fraternity recognizes the change in the social setting and also in the academic requirements. I think this is recognized at the national level where some of the fraternity officers are saying, "Yes, we want to emphasize the academics," but at the individual level, this hasn't always been the case.

Mr. Haase--I will take a chance on some questions from the floor after we go through some of these questions that you would like to put before the panel. Let's take some more of Dr. Riker's time here and put out some questions on residential college concept. I don't know if you refer to this or where you got this from, this dial lecture in your dorm sort of approach to college housing. What is attempted here is to preserve the intimacy of the traditional small liberal arts college while still retaining the advantages in expanded resources and excitement on the large university campus. Clark Kerr refers to this as the multi-versity and said that the problem in dealing with them would be "to seem small while growing big." A question comes to you, Dr. Riker, on this subject of residential houses. You mentioned that in some cases the cost of educational facilities in a residential unit comes free. Could you elaborate on that?

Dr. Riker--Well, as I suspected, this attracted some questions on the parts of a number of you, and may I say that I am really quoting from a statement made by the business officer of Michigan State University to try and capsule this--the idea of the living-learning centers here. They built, I think, eight at a cost of $6,000,000 each for a total of $48,000,000 using round numbers. They figure up the number of classrooms, laboratories, offices, etc., which they have gotten into these eight buildings is the equivalent in value of 4.8 million dollars. They say that the cost of producing these living-learning centers has been about $5,000 per student, and that before they started putting in these facilities, the cost was $5,000 per student. What has happened then in the time that they were building a residence unit with--I think it is a redefinition of space is about as simply as I can put it--to illustrate this; rather than the large social recreational room, this has now been substituted by a series of five, six, seven, eight classrooms with moveable partitions, so you can get all kinds of sizes of classrooms. This is, I think, about it.

Michigan State, Stephens College, like a lot of other places, have used their lounges during the day and they have used their lounges for classroom purposes, not really needing any additional space but just more versatile space. This was a way, incidentally, of getting some academic facilities that apparently there was a limited source of funds for.

Mr. Haase--Another question for you, Dr. Riker. Do you advocate regularly scheduled classes to be held in the lecture rooms of the residence halls?

Dr. Riker--The answer is yes, and again I am going back to one example. There aren't too many, as you know, and I would encourage you to learn more about the centers at Michigan State. Each student has a minimum of two courses during the first two years in the center. They have a general education program for freshmen and sophomores. In more recent years, they have concentrated some of their courses for their social science college in one of the centers. And actually what students do is to look over the course schedule that indicates what courses will be held in a given center, and on this basis, they decide on which building they want to apply for as a place to live.

Mr. Haase--Mr. Obata has gone now. Unfortunately, I think he has been concerned about a problem that this next question proposes, but maybe you might comment on it too, Dr. Riker. How can the advantages of residence life be extended to non-resident students?

Dr. Riker--Well, this question has come up many times. I was talking not too long ago with one of your compeers in the New York office, and I said, "I'm getting these questions, tell me, what do you do about the non-resident college and the commuting student? What shall we do; what facilities do we provide the commuting student that will help?" The answer was very simple. "Just house them." The problem that all of you are familiar with--what to do about the commuting student to make this student feel more a part of the community, so to speak--and most of you know that institutions without residential facilities have long been known as "street-car colleges" as long as there were street cars. The President of New York University has embarked upon a very sizable housing program because of what he recognizes as the importance of the residential facilities. I might just say at this point that I don't mean to imply that everybody is going to be housed who goes to college. This is impossible, but the point is that there would be enough residential facilities so that some students will have a brief experience of this sort.

Mr. Haase--Along that same line, there is a question that comes up about a changing approach to campus planning. We have been talking about the college dormitory taking on some of the functions of academic life within the dormitory house and the question comes about: "Does this indicate a trend toward a reshuffling of spaces of zoning perhaps within campus plans?" Usually, we see campuses grow much the same as a city does--the downtown area, residential communities on the outside and a continual push to the outer ring. The same thing was traditionally true in campus planning and in the things we saw today--residences on the outside, the academic life on the inside. Did you, in your travels, see any schools where this is being done differently, where they have all been mixed up together in the campus?

Dr. Riker--Well, in our own state of Florida, as some of you know, there are a number of new institutions that are being planned. I know of two in which there is an effort to place some of the residential facilities in proximity to the instructional facilities. Now, what we have talked about primarily today is within the same structure, residential-instructional. There are very many versions of this. You don't have to have it all under one roof necessarily, but you can have these facilities in proximity.

Let's assume that you have a residence building and several instructional facilities around it. It is a kind of interspersing factor that I think is definitely being tried at the present time, and I think that maybe this is getting at a different concept first at the way people live in a college community. One of our big problems, I think you will all agree, is that the college community is in the throes now of sort of tearing itself apart: faculty, students and administrators choosing up sides or all fighting against the other. I don't think the picture is quite this dismal, you understand, but just to make the point, however, I think there is a lack of sense of unity in that the way in which the physical facilities are put together helps in the establishment of a community. I am wondering if this may not be true for any community. We have talked about the decay of the modern city, whether or not some of the educational facilities can help in the regeneration of the community, and I would say that the University Circle in Cleveland is an example of just such a possibility.

Does this have something to do with the question you were talking about scale? You have indicated in one of your plans where you are trying to mix in commercial operations, a kind of decentralizing the union, it seemed to me, and putting things right within the housing unit. Does this new attitude towards a mix on the campus have anything to do with the scale as you were referring to it?

Yes, I think it starts with the need to mix uses. Just as a European street is so much more interesting and livable generally than an American street where in our downtown areas, they are lively in the daytime and dead at night. In Europe, they are lively all hours of the day because the shops are on the ground floor, professional offices on the second floor and apartments above. Here, all on one level, more or less on the ground, we mix them and thereby make them work for several things at once--to get the people together. There is a law of gravitation in cities, and I think it applies to the campus as well if you have satellite groups. If you want to go to the center of these groups and be together, we hope this will work this way in our new group at Owensburg. They will congregate in this new part because people are there. You go down the street and if you want a glass of beer and start to go into a tavern and there is only one customer, you kind of hesitate a little bit, but if you find people there and all having a lot of noise and fun, you go in and that's why some are very popular and others are for business. This really works the same way here. Does the campus planning you are doing now, Mr. Fletcher, take a different approach to zoning on the campus?

Mr. Fletcher--No, we haven't really gotten into that. I think it is a very intriguing idea which is a little related as Fred point out in trying to make uses of housing, so they are not so stereotyped and you mix some commercial with living conditions. I remember at Yale we never did know where the classrooms were. It is all rather residential and you can't find out where the classrooms are; the science section is up on Sheffield and on Hill House Avenue. Then there are a few facilities somewhere else, but classrooms there are not very well defined. On the other hand, we did work on a university in Baghdad in which we tried to write a program together with some people from Harvard. We tried to consolidate classrooms with the thought that with the need for a large number of classrooms, not enough had been done in terms of organizing classrooms which could be used by different departments as a kind of pool of classrooms, not speaking so much now of the specialized functions but of the liberal arts and humanities. It seemed to me that this kind of consolidation was a good thing, that this was a good way to use space and an efficient way to use space from a scheduling program. I would be a little worried about decentralization on a large campus from the point of view of travel between classrooms during the day. I'm wondering if there is going to be more travel between room and classroom during the day, more time devoted to this than is necessary and perhaps more total area devoted to classrooms to accomplish the same educational tasks, than if some consolidation of the classroom area were developed.

I think it is a good thing to think about the size of the college and where these approaches apply. At the large one, as you say, it may be more important to departmentalize or centralize the facilities. In a case of a small college that is doing just the opposite that we happened to be involved with in our office in helping finance a study in Leslie College in Cambridge where they are practically rebuilding a whole campus. This is a small school, only about four square blocks, but what they want to do is restructure the whole campus along a kind of an academic street. They are going to turn everything inside onto a new street, a kind of meandering street that will wind through their college complex and scattered along this will be all of the facilities of the campus, intermixed, walk-up housing units above bookshops and coffeeshops. Taking the student union facilities, instead of providing one space in which the students would gravitate toward the recreation and relaxation aspects of the union, they are going to break them down and scatter them about the campus so that you can more casually drop in on these places. Take a study break in an apartment, have a cup of coffee, pick up a book at a drug store; all of this may be right in the same building in which you are living.

It sounds like the street development that Donald Barthelmey did for that study you sponsored ten years ago down at Cardell's place.

Many like it, and Cardell is doing something like that right now too for a new campus in Indiana, I believe.

We are all sort of outsiders here. Actually, we would like to hear one of the experts, Mr. Doebel, comment on the idea of these satellite groups because he is right in the midst of it here at Illinois. Have you gotten into that yet?

Mr. Doebel--Not to a great extent. I haven't been greatly involved in campus planning, except to the extent that we recognize that some of our housing complexes accommodate as many as fairly good sized communities. Our areas accommodate as many as 4,300 students in about a four-block area, and I certainly know that from the student point of view they desire many different kinds of services and facilities. They like to think of their residential areas as communities. They like to think in terms of small group living, but on the other hand, they do like the advantages that can come with the larger group living. We have so many students together to support so many services and different kinds of educational facilities and cultural facilities, etc., it seems to me that this is the one big advantage that the large massive group living situation provides, an opportunity to incorporate a number of these facilities and have them pretty well supported by this large number of students.

Mr. Haase--Mr. Doebel, you have a chance to comment now on a number of other questions on financing.

A question from the floor--it is a relatively rude thing, but I would really like to hear what is going to happen as a matter of cost. This has been carefully avoided, and we have dealt with a great many more expensive humanities.

We are facing a situation in the United States where they want more and more students, and the question is, I'd like to hear us get into the realm of costs.

Mr. Haase--Well, we were just going to do that, sir, and we can work on Mr. Doebel quite a bit. A number of the questions now here are in regard to costs. What percentage of the population can afford the increasing costs of higher education, and what should be done about it?

Mr. Doebel--I'm not sure, maybe Hal has more information on this than I have, concerning what percentage can afford the costs. Of course, there is such a wide range of costs, not only in housing, but in tuition and fees. I suppose the various departments of the Federal Government may have made some computation on this. Hal, do you think of anything on this?

Mr. Riker--The only things that I have seen have to do with increasing numbers of college-age youth who are expected to attend colleges and universities in the future. As I remember, I think it's a figure currently around 30% and it is thought that this may go up to 50%. I think this matter of costs, as so many other things, has to do with values and where you are going to put your money. I dont know, you can say in answer to this question, how many can do what because what can you say people value most and where will they put their values? What will they give up to get a college education? What won't they give up? So I really don't think that this question is one that we could be so presumptuous as to come up with a common answer. Then to get at this business as to how much, what about the increasing costs? I think we are all recognizing the change in the value of the dollar and what it will bring, and how many more dollars we will have to have to do the things we want to do. We can get into this matter of cost in more detail about square footage, etc., if that is what he means.

Mr. Haase--I think it wouldn't be a bad idea just to touch on that point. What does housing cost? What does it cost for you in Florida and you, Mr. Doebel, here at Illinois? I wonder if any specific figures have been put down today on that?

Mr. Doebel--Let me make a comment about what we think are reasonable costs. In our student population here, I would say that roughly one out of every eight students has a car, and yet I am sure that there are a number represented in this one out of eight who ask and fight very hard for lower cost housing. I don't know whether they are doing so because they feel that the car is more necessary than living accommodations and feel that they need a better break on the housing, or if they are like very many people who want as much as they can get for as little as possible. Now with regard to some of our recent construction costs, the most recent project which we have underway for single undergraduate students and I hear them talk about the more typical residence hall, are primarily double rooms, perhaps 10% of the rooms are single, dining facilities, lounges, etc. The total project cost per student was $6,489. That's completely air conditioned. The square footage worked out to 232 square feet per student gross. That would give us then a total project cost per square foot of almost $28.00 for a construction cost only of $23.32. That was for a project started in March, 1965. Going back to the one started just prior to then, in November, 1962, and it is one you will see on the tour, those of you who are taking it, the Illinois Street Residence Halls, which again is a similar type facility, but the Halls do not have complete air conditioning. It has air conditioning only in the main lounges and dining rooms, etc., but not in the student rooms. In about the same size project, this one will accommodate about 400 students. The first one that I mentioned accommodated a little over 1,300 students, and the total project cost per student was $5748. That is $5,748. There were 227 gross square feet per student, so our total project cost per square foot is $25.36 or construction costs of $20.54. I can go back to earlier ones, but at least they give you some idea of what's recent.

Is there a question on those figures?

Does this include equipment? That's right. All moveable furniture, interior decorating, landscaping, food service.

Do you mind giving us a figure on the latest?

The one that is under construction now?

$23.32 construction costs.

Mr. Haase--Mr. Riker, can you give us a couple of things like that too?

Mr. Riker--The figures freshest in my mind are those for two, fourteen-story towers that are currently being considered on our campus. Actually, we hope to open bids next month, and I hope these estimates will count but these are estimates. These two towers will be air conditioned. Actually the student rooms are in the form of two-bedroom suites with small kitchenette units. You can also call them a type of apartment, but we are estimating a construction cost of approximately $4,000 per student or $18 a square foot or a total cost of around $4,500 per student. I recognize that these costs are considerably lower than those you will find in New York and some of the New England states. Of course, we know that the northeast is one of the most expensive areas.

How would that fit into, say, Clark College costs?

The Clark College cost somewhere between $18 and $19 a square foot when it was bid in 1963 or '64. It has 350 feet per student, as I recall, and it runs around $6,000 construction cost.

The last study that I did which was several years back showed a country-wide average and, of course, averages are so misleading.

All of these things are misleading because we could spend the rest of the afternoon discussing what is included in the prices. About six years ago, just as a rule of thumb, about $4,400 was a national average.

Mr. Haase--Some more recent figures I saw from the U.S. Office of Education were closer to $6,000 national average including dining space and furnishings.

It is past the time allotted to us. I still have some questions to go, but I know the University has some social events scheduled for us and you would probably like a chance to relax before that, so I will close now unless there is a question from the floor that someone would like very much to have the panel discuss. I have learned a lot today and I hope you have too. There is a question.

Question unclear.

Our figures have been somewhat between the range that Mr. Riker and Mr. Fletcher mentioned. I don't have them with me but around three years ago, it was around $4,500 per student of total project costs, not including dining.

These were all figured without dining at that time. We are estimating now around $5,500 not including dining. It is a little over $6,000 with dining. The prices are going up so fast in our area that they are out of sight. With the tremendous expansion in the northwest, schools which bid about $16 a square foot a year ago are coming in at $22 and $23 now--a rise of over 25% in one year.

I might just say something. Fred and I were talking earlier about some discussions he was having with regard to the possibility of deferring construction a year or so in hopes that perhaps interest rates might come down and we might come out better financially. So we worked something out and we found that a 5% decline in interest rates is required to offset the 3% increase in construction costs. Now the reason we use that 3% is because this has been somewhat the going rate for the past several years, but I think that 3% is rapidly going out of sight. I think increases are going to be much more than that. In other words, if a project which costs say $1,000 could be financed at 4%, if we were to defer it a year and encounter a 3% increase in construction costs, you would have to finance that at 3.8% interest in order to come out the same each year.

TRADITION AND TRANSITION IN HIGHER EDUCATION

Paul L. McKay

The 1960's constitute an era of great expectations for higher education. The problems, goals and needs of education cover a majestic expanse of human experience. The role higher education plays in contemporary society is too demanding for its shape to be molded by default or improvisation. It needs the informed and sustained guidance of enlightened citizens as well as the insights of academicians and professional educators.

This evening I would like to address myself to a consideration of some of the roles that higher education plays in American life, touching primarily on tradition, which involves perpetual change and transition which is our ever-recurring link with tomorrow.

Higher education expresses a wide range of anticipation on the part of the modern man. In our society, schools are recognized as constituting the chief instrument of social change.

In the United States, higher education is central in the conduct of our national life. When society defines its shifting and diversified needs, it then looks to higher education to supply these needs. The pendulum swings from mastery of atomic physics to mastery of hotel operations; from knowledge of Greek literature to knowledge of advertising copy; from training for medicine or law to training for athletic directorships.

Higher education, as we know it, in this country is a uniquely American institution. Perhaps the basic philosophy in America is best characterized by the words "pragmatism" and "functionalism." In an open dynamic society, we are remarkably free from the classical restraints of tradition. We want what works well and whether it has been done before matters little. As a nation, we are not yesterday-oriented. When we have been at our best, we have always take an unfettered stance toward tomorrow.

Most studies of European universities in the eighteenth and nineteenth centuries support the conclusion that Europeans persisted in using their schools for the re-creation of traditional skills and the perpetuation of inherited values. In Germany, for example, the university was the citadel of tradition. Its function was to preserve the past and to train the young along old and familiar lines.

Almost by instinct, Americans soon came to realize that they would use both schools and universities to accomplish the things they wanted to get done. The American universities were eager to cut across all streams of social and religious thought.

Even the colonial colleges, like the college of New Jersey (Princeton) and Rhode Island (Brown) provided in their charters for representation from various religious denominations. Contrast this to Oxford and Cambridge universities where dissenters were rigorously excluded from the student body and faculty until the last quarter of the nineteenth century.

In our country almost from the very beginning, our schools were called upon to do almost all the things society expected. Almost from the start, it was understood that education would serve the needs of man and would be responsible to those changing and emerging needs.

An eminent historian[1] has recently pointed out that American schools at almost every level early in our history developed into general purpose institutions. How interesting that the term "general education" should have caught the fancy of Americans. And how interesting, too, that in this country, it should harbor some of the ambiguities that Americans read into the word university.

For over a hundred years now, schools and universities have had a bewildering assignment. They have been called upon to prepare young people for the professions, for industry, for farming, for business, for nursing, for the stock market, for marriage, for citizenship, for society, even for life. No other educational system on the globe is required to be quite this eclectic or this ambitious. The wonder is not that American schools so often fail, but that they often succeed in at least partially achieving these miscellaneous aims.

Of all our early educational philosophers,[2] it was the American, Lester Ward, who argued most persuasively regarding the aristocracy of talent in a society free from traditional structures of class or creed. Ward was characteristically American in his own universality and ambition. A poor boy who grew up on the Illinois and Iowa frontier, he had little formal education, and most of that was bad. However, it did not occur to him that this mischance should exclude him from the ranks of the erudite, and he became in time perhaps the most deeply and vigorously learned man in America--botanist, geologist, paleontologist, and leader of American sociology.

He was at the same time one of the most original and profound of all our educational philosophers and ranks here with such giants as Jefferson, Horace Mann, Jane Addams, and John Dewey. His philosophy was set forth first in Dynamic Sociology (1883), more elaborately in the Psychic Factors of Civilization a decade later, and then in Applied Sociology (1906). It is by now orthodox enough, at least in the United States. All progress, Ward insisted, comes through art, not nature--here we are back with the founding fathers and their rejection of fixed laws. Nature is wasteful, slow, and indifferent; man is economical: he speeds up the natural processes, and is himself inextricably involved in the process.

According to Lester Ward, man has survived and created civilization by triumphing over nature. Indeed, civilization is the triumph of art over nature; it is, precisely, artificial. All civilization comes from the deliberate intervention by man in the processes of nature. Benevolent intervention must come from education. The function of education is to achieve and prosper civilization. It is a function of any society, for on it depends survival and progress.

What this meant, as Ward never ceased to point out, was that society could not afford to waste any of its intellectual or creative talents. Heretofore, it had not always done so and one reason that progress had not advanced more rapidly was this waste of human potential. Ward was convinced, and on scientific grounds, that talent was to be found everywhere, and in all places in equal abundance--among the poor as among the rich, among the Negroes as among whites, among the perishing and "dangerous classes" as among the respectable.

These are the principles on which most Americans acted almost instinctively from the beginning, and on which they still act. The two foci of American higher education have been society on the one hand, and the individual on the other.

Much of the recent turmoil in American higher education, as you well know, centers upon the alleged depersonalization of education resulting in the growing alienation among students, faculty and administration. The intensity of the unrest indicates the conviction that higher education, American-style, expects the personal equation to be strongly recognized in our colleges and universities.

There has long been this duality of purpose in higher education, and it constitutes an ongoing dilemma: how to meet society's needs from the standpoint of the sheer numbers who are flooding our campuses and at the same time meet the psychological needs of those students in terms of personal contact, friendship, and understanding.

Although students live in an extroverted society, they are a highly introverted group. I like the insight of a college sophomore who said, "I believe that an individual must keep part of himself totally to himself. This is the stabilizing part of my life. Without this I am a leech on life--an animal without a backbone." Then she added a fear, "Perhaps I really have nothing to conceal which is meaningful to myself alone."

This young lady whom I have quoted was a sophomore; she had an insight that some Ph.D.'s never experience. Today we hear a great deal about both conformity and rebellion. Conformity for the sake of conformity is bad. Rebellion for the sake of rebellion is equally meaningless. Being a person means more than either conformity or rebellion.

In one of our colleges, a group of students wrote and produced a play that centered around the thought of human relations on the campus.[3] The play probed for the meaning of being a person. One of the participants had an unusual line. He said, "Sometimes I feel like going up to a man, smashing him in the face just to find out if he is really there."

Something like this may have been in the mind of Soren Kierkegaard, that disturbing Dane, who once said that the reason he turned back again and again to the Old Testament and to Shakespeare was that those who spoke there were at least human beings: they hated, they loved, they murdered their enemies and cursed their descendants throughout all generations. There are, granted, some unpleasant characters in the Old Testament and Shakespeare. But you do not feel like walking up to them and throwing your fist into them to see if they are really there, they are not just roles; they are persons.

Walt Whitman was more than an apostle of individualism than an articulate spokesman for what it means to be a person. In his poem "By Blue Ontario's Shore," Whitman said:

> "I swear I begin to see the meaning of these things!
> It is not the earth, it is not America who is great
> It is to walk rapidly through civilizations, governments, theories
> Through poems, pageants...to form great individuals.
> Underneath all, individuals!
> I swear nothing is good to me that ignores individuals.
> The American compact is altogether with individuals.
> The whole theory of the universe is directed to one single individual,
> namely to you."

These two concepts--the individual and society, both fundamental, have tremendous implications for higher education.

When you stop and think about it, not all knowledge necessary for survival has been discovered in this nuclear age. Some very important insights go back before your lifetime and mine.

> "The word 'modern' has two different meanings. It may mean contemporary in time; in this sense, Plato and Epicurus, Shakespeare and Montaigne are not modern; it may mean contemporary in spirit: in this sense they are...modernity is a question, not of date, but of outlook."[4]

A student in "A Survey of Western Civilization" on another campus said to the instructor, "Sir, I honestly don't see any use to all this stuff. I mean, all these people, like Socrates and St. Thomas--well, I mean, I don't see what they've got to do with me." The class was silent and a little tense; the question, or statement, could have been taken as impertinence.

The instructor, however, felt the honest puzzlement, the frustration behind the question. He asked, without resentment, "Mr. Jackson, how old are you?"

"Nineteen," the student said, expecting sarcasm or scorn.

But the instructor turned to the class. He said quietly, "Gentlemen, you are all nineteen or twenty. You are the present; you are today. And today is the inheritor of all the todays of the human race. A few of our race have been wise--a lonely, lonely few. A few of the billions have been gifted with the vision of human possibility. They are a distinguished company. Homer, Aristotle, Sophocles, Aquinas, Leonardo, Virgil, Dante...Copernicus, Galileo, Kepler...Cervantes, Milton, Hobbes, Locke, Mill, Tolstoi, Newton, Chaucer, Nietzsche, Einstein...."

He stopped for a moment in the roll call of great names. "I suppose," he said, "that it is a kind of miracle for those of us who are nineteen, or thirty-nine, to have the privilege of spending some of our time, of committing some of the vigor of our youth, to the company of the wisest members of our human family. One does not learn how to make a living in a family, but one may learn to live."

I do not know how the instructor's words affect you--perhaps not at all. The class, however, responded with understanding. Without being dramatic or sentimental, their instructor had spoken simply and with the gentle conviction of a man who deeply wanted others to understand the miracle of human greatness and what a vision of that greatness could mean.

Against this background, I think we can understand what Harvard's President, Nathan Pusey, meant when he said recently, "The chief aim of undergraduate education is to discover what it means to be a man. This has always to be done in personal, individual terms."

What use is there in knowing what Mill said about liberty,[5] what Milton said of freedom of printing, what Voltaire said of the good citizen, what Spinoza said about freedom of thought, what Locke said about tolerance and justice, what Jefferson said about democracy unless that knowledge is transformed by each of us into something that guides and give purposes to our own lives? Knowledge does not exist in space. It lives in minds, attitudes and beliefs.

Informed citizens will do well to hold in balance these two perspectives as they reflect upon the role of higher education in today's world: from the standpoint of tradition, it is the purpose of education to fulfill, enrich and enhance the life of man; from the standpoint of society it is the purpose of education to provide the skills, the techniques and the personnel to serve our national goals and to make available to the human race both the insights and tools that give support to the individual in his quest for purpose and meaning.

With these objectives as guidelines, we can, then, get on with the business at hand--and make of the last half of the 20th century a monument to the creative human spirit--and form a lasting tribute to man's unconquerable mind.

FOOTNOTES

1. Dr. Henry Steele Commager, "Social, Political, Economic and Personal Consequences," *Universal Higher Education*, Ed. Earl J. McGrath, New York, McGraw-Hill, 1966.

2. Cf. Commager, *op*. *cit*., pp. 9-10.

3. Garrison, *The Adventure of Learning in College*.

4. Richard Livingstone, *Some Tasks for Education*, p. 5.

5. *Loc*. *cit*., Garrison, p. 258.

UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE--REVISITED

Walter A. Netsch, Jr.

Not so much the year's reflection but the problem I think I can show you today which many of you will visit tomorrow is what happens when your first new campus is in transition. Very kindly, the undergraduate campus at the University of Illinois at Congress Circle is an example of what is contemplated in the future--no longer to be an undergraduate campus at the University of Illinois Congress Circle. It will contain graduate studies, and so many of the things that you are going to see today are going to be involved with the transition which the architects present are not aware of; but I know that those from education are certainly aware of it. Also, we will go through the slides and you will notice what is not seen but what is a normal function of American society which has a major input on the campus of Chicago; you can call it the affluence factor. You can call it any series of names that you want. The criteria from which the campus was devised were done in 1960. This is 1966. We are talking about projections to 1974 and beyond. We are talking about and you will see slides today about theoretical inputs of the campus--traditionally called 2-3-2 environments where the percentage distribution for freshmen and sophomores, juniors and seniors, threes and the graduates two. There are just as many graduates as there are freshmen and sophomores. That is a theoretical analysis because this university as any other is forced to live with the problems of expansion, forced to live with the realities of change in educational programs. It is forced to live with changes in criteria. This, therefore, means that the campus will continue to be one of the early guinea pigs of a campus from scratch in an urban society. The faculty both like and dislike having to live in a phase-one environment. I can't honestly stand here and say that every member of the faculty is promised the opportunity to live in a phase-one of an ultimate environment that is the most rich in response that we have ever had, especially if you are a professor in science and engineering and are temporarily divided from one end of the campus to the other. These are factors which are hard to play. Of course, they don't realize that it is a problem of phasing but many of them, of course, were not members of the campus faculty at the Pier when it was a 3,500 student campus and when the Pier was a junior college environment. We talk so much about the population explosion and education explosion; you are going to see these factors as we go through the slides. We are going to do them in several sequences. We are going through phase one, we are going touring tomorrow, and we are going to go through phase two which is the beginning of construction. We are going to talk about theoretical phases 3, 4, 5, 6 and X--all of which are functions of, as most of you well know, the decisions of the Board of Higher Education, the decisions of the Board of Trustees, the Legislature, the Governor, the federal grant program and NIA, NSF, OEF, etc., and they are not completely fixed programs. You are also going to see one building in the phase-two program in which the new building Art and Architecture is an example of new, but nothing new under the sun. Let us say new to us approach to kind of resolve this matrix problem in an expanding architectural environment, a physical environment; and this we have nicknamed the "field theory method." Those who look at your Architectural Forum will notice the cover with the combination of a radio and a linear system on its proposal for a college in Alabama. We have, in essence, on this first campus a kind of bachelor's proposal which is a combination of several systems in the matrix which are both linear and objectorial. We are going to end up with what would seem to many, and I apologize that they are deploring it. But I think there are pretty critical problems in how to devise new ways of looking at the problems of building, new ways of trying to find that which is more or less permanent in the areas of social communication and the means of getting beyond the absolute necessity of recognizing changing physical environments over a period of time in which instructional laboratory, research laboratory and possibly all the social space, etc. This kind of study, as I said, is applied to this building, and I think we can apply it to several others on campuses; but I am going to show you what is known as hard-nose theory drawings. By that, you will discover what we are trying to discover--what the techniques are. Before I start on this series, I think I should remind you that everyone starts from a kind of corner whether we are talking about the work of Renaissance, Gothic, Greek, or architecture in India. We are always talking about development of a kind of order. Most of the great architectures that have come out of a re-creation of a relationship in that order and the factor of knowledge of geography and mathematics available at that time. Our society has new geometries and new mathematics available for use; it, however, is not as simplistic as that environment that existed in the past. We are all aware we have control of air conditioning, cost of spaces, materials, methods of determining fixed and moveable equipment and a lot of other factors which were not apparent in the earlier environments. So we will see that we have a more complex problem, as we may at first discover; this is a more complex series of drawings, but out of it we are trying to look for new areas of ways which we call a non-simplistic display of simplicity which faces the issues we think are at hand.

For those of you who are unaware of Chicago, this is the famous Burnham plan of 1913; you will notice Grant Park and the wonderful order of the environment. You will notice the hubbing city Civic Center, as he envisioned it as a French Renaissance city. As you will recall, it was right on axis with Grant Park and was to be a centered city. Mr. Burnham was right; it is the center of the city right on axis with Grant Park and it's the intersection of the Eisenhower, Dan Ryan, Kennedy, and Congress Expressways. I don't know how the man could have had so much foresight for where and why the city would be; he was also aware of the problems of transportation. You can also see the University of Illinois Chicago Circle is located immediately southwest of that intersection and becomes a key of hard and durable environment; it is at the beginning phase. Its beginning program was planned for an undergraduate commuter campus with a capacity for 20,000 students involved in the curricula of science, engineering, liberal arts, business and commerce, art and architecture. These were the disciplines that were to be carried on in this environment. Concurrently with the development of this campus, the Board of Higher Education put through a proposal on the development of junior colleges. I think there will be seven or nine throughout the State of Illinois which is already getting at the fact of the changing attitude toward a four-year campus in any location. Also the teacher colleges and the former teacher colleges have become full-fledged colleges and universities throughout the state. We can see the whole series of studies throughout the evolution of this site selection, though each red dot represented a potential pick of students and their ability to get to the campus in an hour and a half by rapid transit or by automobile. This was a criterion in location. The subdivision of the campus was additionally anticipated in this proportion for 9,000 students, this proportion for 20,000 students, and a small proportion for research and a small proportion of graduate students which is a serious responsibility of a proportion for any state university. Needless to say, it is that factor that makes its input in theory, if not in practice, the visiting of the campus important. This is an example of a current study, but I forewarn you on the charts--we are inclined to make all our charts in a series of values as they represent time sequence. Here we are looking at a projection of Mr. Bareither's, whom you heard yesterday, of his statistical report on the programmatic needs of the various times, and you can see the upper left-hand corner represents offices and staff, and the one at the top also represents offices and staff. The one at the right represents instructional staff, and the lower right-hand corner represents instructional laboratories. The lower left-hand corner represents research laboratories. Out of these various slides, you will see very strong individual patterns among disciplines. Most architects say so visually and to have these around us, to be aware of the rate of change in time and character which is to say that, of course, the metallurgical curriculum is different from an engineering curriculum. Beginning to see what these mean in terms of physical environment is terribly important. Of course, this doesn't obviate the need for the perfectly straight-forward rational analysis of micro-needs. This happens to be from phase and shows one of the classrooms with fixed seating; this is a part of the funding program and involved criteria for that. When we come to 1960, I hope you will notice on this series of studies on relationships of offices and laboratories the essentially linear character needs. You will see how later on we came to re-evaluate that linear environment. These are density studies in relation to the various disciplines. As you go through, the red represents liberal arts, orange represents science, blue represents engineering, green represents parks, so we have color coded our problem. These are very early site studies where the campus is searching for identity, and we have looked at the problems. You will notice to the lower left what was the beginning of the walkway. Although we didn't know it was this spine connecting the various disciplines; you will notice the circles are not always complete. They represented attitudes toward phasing along with completeability, or completing a whole campus. But the other one should involve a school with a lower division isolated from an upper division, or whether one should go to four completely separate colleges as at MacMurray, Santa Cruz. And there are more statistics.

In planning an urban campus, one of the major problems is the arrival and departure of initially developed criteria of the campus. After checking almost 11,000 automobiles by the time we got to a 3-2-3 environment, this was even more than a shopping center will provide. In relation to capacity we have a means of mass communication, and this is one of the series of studies in a rough problem of departure. You will notice the major arrow represents the major freeways. In fact, the 30% in the lower right proved to be more accurate, but inaccurate on the negative side; we are having trouble with the entranceways of those first lower gray spots. We also have had a series of problems in the relationship of the campus to the environment. I think it is safe to say that in spite of slums, it is involved in conservation and renewal, and it is located adjacent to one of the largest packets of low-rent housing in the Chicago area. It has problems in the social environment which exist on almost any campus in the United States. We also have opportunities to go through several of these as we go along. One is utilization of teaching techniques, the evolution in which the top guards utilize the teaching techniques. The second one is a problem of flexibility. You can always correct and make something very small or something very large and change it in a disciplinary way within its relative scale or make modifications which are relative to the scale. The third one is the problem of living in an urban society--how can we make use of both high- and low-rise buildings? And the bottom one with a mix of colors we try to get a disciplinary opportunity. This is one of the very early schemes of the campus. We actually developed 27 different models. In all cases, we reviewed the criteria for 20,000, and cutting it back to 9, 8, 7, 6 in accordance with the then existing programs. This capacity of working from a number, although we recognized that twenty was not fixed, it gave us, at least, some method of evaluating the decisions we made as we went along. You will notice the proliferated small units in the middle, the very large units on the head, and this, of course, was redefined as we went along. This is a more traditional campus than we have here at the University of Illinois in Champaign-Urbana where you can see a green mall in the middle. We have essentially a rotational system which, of course, had problems because we could not expand easily in the upper right-hand corner rather than the lower right. That, of course, forced a re-evaluation of the site. As we look at the site and its specific problems, it had an agreed upon position not to consider moving into the community. Immediately it had a fixed number of acres, 106, for an ultimate demand of 20,000 students. The center portion which you see "site" written on is the academic area which was designed to accommodate 20,000 undergraduate students in the development plan. You will see how the input of graduate students has made a confinement of these boundaries impossible.. Of course, the scheme is based primarily on the intensity of use. As opposed to a graphic water diagram, it is a simple intensity from the center out--from the very center is our major public space which is more than just a green swath. It is an active kind of young adult jungle gym, conference and meeting center which is above the lecture center, adjacent to classrooms, adjacent to the library, and adjacent to the student center.

With that intensity of use in the center, we fan out where the larger elements represent laboratories or special discipline centers--art and architecture--where the time spent in environment is longer and where they don't contribute to the intensity of housing environment. Here you can see an early study model as we were groping for this change in scale which we felt also was an intimate part of the campus planning.

I think all of us were aware of the fact that we couldn't possibly plan to build a campus until we took a photograph of every campus 25 years ago. We took a scale of those buildings, and I will duplicate those today. You will find that you have to proliferate the particular discipline of five or six of those buildings, and so we have a changing scale problem. We want, however, to define the problem of variation in human scale as well as in academic needful scale.

This is a final model as it was developed, and you can see this instead of the Renaissance city hall. In the lower foreground, you can see the intensity of use of that central area of the campus. We have about 40% coverage within this area. We run, I think, a ratio of close to 2.4 people in 6, fully developed. We have the major urban space in the middle, and the garden space at both ends in the lower right and the far left. These wëre left open because of the utilities and their expanse and development. I think you can see from this drawing the intensity of use of the site. It is intended, in theory, as the one building scheme, although in essence it is not. It is a transitional road to a more continuous environment with walkways scaling the building forming a continuous network.

Here we can see the first phase of construction with the city in the background and you can see the wonderful play of the adjoining neighborhood which is Maxwell Street, the flea market. It is a wonderful contrast, and I think an exciting phenomenon, if we can inject the intensity of communication as it exists here into the social spaces of the final campus area. Here is the center of the campus, and you can see the development. It was initially benches located on the periphery but it was decided it was more like putting sparrows on a telephone line.

It would be more socially responsive if we could devise ways in which students could form their own grouping. The amphitheater in the center is of a formal nature and also forms the staircase to the lower level and the left center beneath. You can see these walkways which come from the parking areas, come from mass transit and immediately develop a high-speed, quick means of access either at this upper good-weather level or at the lower bad-weather level and connect and unite all the buildings. They also tend to channel what small open space we have left to more passive student use and then to permit those areas to achieve their own characters. As you can see, it does function as an adult jungle gym.

Here we can see the building, which to date has to house all of the administration and faculty in one high-rise building. This is not the end aim, nor will it be the correct aim. The character of materials is very simple--granite, precast concrete, brick. Here is the tall building. Most of you will notice that the spans change as they go up. It was a deliberate attempt to try to resolve these energy forces.

We decided very early in the project that it was a goal to use the same strength of concrete throughout the whole design, so that the problem, whether big or small, would not outweigh the intensity. We tried to use the forces of energy as directly as possible, so that there will be a means of communication in the cultural environment to students who may not have had this perceptual opportunity in the past; and for any student it makes, I think, a meaningful structure.

This is the very top floor of the space. This is where the big conference rooms are, for you can see it is exposed concrete with a carpet and some oak paneling. It is very simple, the gifts of art from the printer here in Urbana which truly enhance the space.

As we look back at the city from that same floor, we can see the proximity of the city to the environment. You can see the scale of the library which is actually 30% of size at this time. It doesn't reflect the needs for a graduate and research center in science and engineering, but as we enter into the central area we see the amphitheater in the middle, the lecture center, the library itself, and the large span with 2 simple cords--the evolution of flexible space.

You can see again the character of this environment as the usual breaking of the concrete--you are looking at what we call a tree garden. It is actually a public space, it is a place where we have anticipated setting up some plastic stool chairs which the students can store in these various pockets which will be used at the garden level as a contrast of the coming together of spaces at the center of the campus. This is where students or a group of students can isolate themselves from the environment.

Transition in the walkways from the lower to the upper level shows more protection in the lower level. You can see the walkways are more or less protected hovering in the lecture center, and in fact, the lecture center itself. You can see from here the variety of lecture rooms provided; the radio system has been developed for that open space in the middle, so that at a future time an electronic station can be developed which can feed all the lecture rooms at the same time with different material without the use of instructors.

We have the larger 500 person lecture room. We have two lecture rooms which go down to large preparatory spaces; we have both tablet arms and continuous tables. It seats approximately 3,400 students at one time.

This is the 500 student lecture. You will notice in this lecture we have used all Charles Eames chairs and in the classrooms we have developed the adaptation of the 40 or more chairs with general fireproofing.

We tried to pay attention to details, changes in texture. We even designed the waste baskets as basketball hoops to try to encourage debris throwing. You will also notice great changes in scale between the small piazzas around the classrooms as compared to the larger scale of the major building.

This is a kind of walk-through. This is a classroom with lockers especially designed with acoustical material on its surface to try to dim the hall noise.

Here you can see the operation. Charles Eames has suggested that we try this on one-minute cycles. We are going to try this with a moving camera in the spring to see how the students perform and see what kind of patterns come about.

Here you can see that the buildings themselves are used as gateways to the campus. See the large undergraduate laboratories with signs and engineering. You can see that they are based on a cluster system with about eight laboratories about preparation area, or they can be redesigned as classroom or research space.

Here you can see the building has two structures--one structure with a more or less fixed laboratory and the top structure in column three space which would originally accommodate a percentage of research initially anticipated. Looking back from that building on the campus, you can sense the density of an urban campus in an urban environment. Here you can see the lighting as it begins to take effect in the center of the campus. We are trying to accommodate that rather than the use of standard light fixtures. We had the cooperation of another manufacturer, Lightolier, in the development of special fixtures which are now available on the market. So what you will see tomorrow as we go there is phase one of those elements of construction, which are in red. You will see the tall 28-story building with faculty offices at the present time which will become eventually offices and classrooms for humanities. You will see that portion of the library, the lecture center, classroom cluster, classroom cluster north, classroom cluster south, the first third of the laboratory unit and the student center. The area in orange on phase two is this extension to the library. This extension to the laboratories on the first phase of art and architecture is the first phase of our kind of building which begins to show a transition of the problem of needs of the future.

This is what we call building 631; it was originally called SEO. It is quite obvious from its shape, its key plan of 10 units can be divided either for offices or laboratories. The building was designed to accommodate future installations of utilities and the vertical shaft which you see here feeds this area. The building is in a prominent location on the campus to make the assumption that it can be either one thing or the other; so it is the beginning of a series of designs to allow the change of transition. You can also see one open space opposite it to the south which is the south garden where all the utilities are located.

Looking back at the center of the campus, the other building is phase two. The rest, of course, are additions to existing buildings. This is the building for art and architecture. This extends the thesis of the walkway, the thesis of the matrix much further since this building is the synthesis of the whole scheme of the campus in one building. Its programmatic needs are not as complex as for laboratories in science and engineering and, therefore, made it a more feasible start in this new field theory study.

You will see from this series of diagrams what we were intending to do, to provide a capability for a linear distribution of offices, classrooms or spaces in accordance with that checkered diagram. We discovered that no matter what program we have, there are demands for central spaces and if you look closely we focused about a square in the middle. This happens to contain the educational resources center for the art and architecture, the exhibition space, the jury room, the central staff offices and some particular graduate painter studios. Thus, it is focused about which everything whirls.

The checkered squares represent opportunities to define areas of identity in terms of a volumetric order, so we are looking for a linear and a volumetric order in the distribution of classrooms and spaces. We have also on this particular building a regular program and our concern for this opportunity; I must say that the Dean and Chairman of the School of Architecture and Art were cooperative in resolving their physical problems.

Those circular arrows you see are a means of communication from space to space throughout the whole building. Defined in mathematical terms, you can see then we have these three basic studies on the top and the three basic studies on the bottom, but at this moment it is sectioned. We have a white area, and the black area in the center is the focus for constant use. We have the white area which is the major circulation for all spaces on the interior which causes a greater net area. We also have a secondary circulation which is the checkerboard and is actually helix developed communication to all the various spaces. You can see that this white area in the center is really the extension of the exterior environment to a diagonal system where you literally move on the diagonal.

You do not have a floor-by-floor typical layer throughout the system. You can see it in this diagram where the School of Art and Architecture is essentially a work space--private studios around the edge for a sector, the ability to move from one group into the other. You can see how this outside spine feeds to the center. The form of the building therefore comes directly out of this system, and you can see it in conjunction with the University Hall in the background. While all of this was going through phase two, we were still considering the fact that it was a 20,000 student undergraduate campus. Then we suddenly discovered that we could possibly be dealing with a 24,000 student undergraduate campus, a 35,000 student campus or any series of numbers. So we tried to study what the input on this initial concept would be on the changes in growth not originally anticipated. The first series of slides are simply an inventory of the way the spaces were used. In other words, we took inventory of the way the space happened. Also, we took inventory of the utilities around the campus. You can see the utilities we had to work with in the first phase. We had to worry about the utilities which concerned the parking lots. We also had to worry about the problems of parking in the areas of blue spacing for size as they still remain on the periphery.

And now comes an interesting series of diagrams which are extremely important. I will go through them quickly. They represent changes in attitude. There are changes in subject matter being offered, changes in the subjects being offered, utilization to be achieved at the same rate. You can see here two phases of estimates of classroom environment, 1970 and 1974. We were faced with the 1960 criteria. Now you can see the new criteria, although we have over four times as many classrooms projected as in the initial program, this is the old criteria for offices for 1970 and 1974. Here you can see the transition in the distribution of students--the top part representing the freshmen and sophomores and the second line across juniors and seniors, graduate one and graduate two. You begin to see the effect of the pile-up or back-off in the freshmen-sophomore environment over this period of time, the quick build-up in juniors and seniors, and then you begin to wonder what would happen if this same kind of thing occurred in the graduate area. You suddenly discover that if you project this, you can see the 1967 environment of the university's total volume. You can also see it above in the individual areas whether we are talking about university administration, business administration, education, engineering, architecture, sciences, liberal arts, social work. The '67 which is primarily an undergraduate campus is completely developed in its junior-senior environments which kind of mix. You can see in 1970 the added square footage necessary to accommodate additional juniors and seniors and the input of graduates. You can see in 1974 the added square footage necessary to supply the increasing number of students in an increasingly sophisticated environment. As you can see in the blue area, the amount of research space starts to overpower the distribution in the space permitted. You can see then in classrooms an intensity of development in '67--part of that, of course, is a projection on developing in quality between the 1960 and the 1966 criteria. The heavy dosage in that section is what you might call up-dating factor and then a very quick fall-off as the problem develops. And so you can see the transition which happens to be engineering, its characteristics, for example, in the instructional laboratories, a very heavy development in contrast to the signs that you saw earlier. Here is architecture and art, its heavy development.

Here you can see that summary sheet will those three bar graphs. In 1967, we are supposed to have 14,000 students; in 1970, we are supposed to have 18,000 students; 1974, we are supposed to have 24,000 students 2-3-2 with a theoretical 35,000 students. So you can see the real change in transition, the type and qualities of space in relation to space demands for students have an obvious effect on master planning in the character of the building. So, along with this we are making a series of regional studies on communications. This is on transportation if the campus expands. These are problems of land use in the community plus changing factors which will occur allowing for a better relationship between the university's on-going environment and what essentially was developed out of all this data. The yellow circle then is representing almost a lower division environment. An overlapping in the blue and orange in science and engineering between the undergraduate upper level and graduate environment, a new subcenter to the south, and then in the upper left-hand corner a new subcenter in the behavioral sciences and in humanities. So we are developing initially one drop of water which has developed into the three drops of water scheme, and you will notice a projected fourth relation to the community. The evolution is then of sites for expansion and the attitude of how these new programs should be planned and a series of events of trying distribution of spaces. We are going through a whole series of documents of desired line--the heavier bars represent the regard for professors for communication, the smaller thinner bars represent the desired lines with other disciplines. Now we are researching for a system. Then you can see how these patterns change as they will change in time. And here you can see at site 1 and 2 the humanities and the social sciences accommodation in this matrix of their disciplines and their relations to humanities which is the right arrow in the right-hand corner. So we have here, essentially, a social science center in the green, a behavioral sciences center in the red and humanities center in the existing high-rise building. You can see how these matrix organizations are beginning again to represent demands beyond the initial construction if we try to feed back the ultimate problems of formal communication into the initial scheme. Now in the humanities area, you will notice the cross hatch becomes a very important aspect, out of this comes a change in this building. We are going to devise a new entrance to the high rise which will put classrooms on the first two lower levels which will not use the elevators, and then have direct access with walkways. Then we will have the distribution of the humanities except for the language laboratories and some portion of administration in the existing building. It is an ultimate projection at this time. Then a series of diagrams in relation to the business office and their inputs in the problems of student counseling, student affairs, nonacademic personnel, and how we will utilize this as a means of communication with the city as a whole as well as means of communication with the students. It is now in transition to engineering--you will notice the checkerboard offices are smaller--we have instructional labs on the left, research on the right--on the bar intensity graph, you will notice that these change. This chooses to develop itself into four separate divisions. We have another discipline that chooses another area--how can you do, in a sense, a standard building with these diverse attitudes toward their own discipline in relationship with their own laboratories? You can see from this the reason for our series of studies. This is the desired diagram in relationship to the diagram for science and studies and engineering in what we now call site 10 which is the south center directly below the existing campus. Then two diagrams on the problems of the individual environment--we are talking about the attitudes toward the physical environment, the disciplinary environment and the interdisciplinary environment and how these things affect not only the response in the structure of the student environment but the architectural form. This is a theoretical study done on an urban graduate center in an urban area in which you can see four basic items--raw data, pure research, community laboratory, and applied research. The bottom represents the various colors of the discipline we have been using throughout plus the community interrelationships to the various four diagrams up above which then gives you another idea. The concept of a matrix is the fact that the Architectural Forum has been saying that the "University is the micro-environment of the city," and it is our means and method of trying to resolve this that leads to research for new solutions for re-evaluation of the old and the necessity to understand what we have.

You can see in this last diagram what I told you about earlier--the U. of I. Congress Circle revisited. The orange is the first center--this is the initial concept in order to grow and expand with changing concepts; there are two overlapping yellow subcenters. The blue and the green represent the major centers for either parking or for mass transit. The yellow subcenter at the top represents the future beyond anything now even projected. So you can see here what the concept of the campus means, and why the immediate concept was not safe even before it was complete. These are a series of geometric field studies--this is our own language, our own order, in order to develop our own idea of a linear environment in which we can get offices and laboratories either adjacent, separate, or across the hall. This is when you begin to accommodate all these varying needs rather than dogmatically saying that one thing or the other must happen. We are also fully convinced that the major walkway, this center space of the campus at the University of Illinois has been a social and intellectual asset, in the sense that it greets communication with the student in a visual environment beyond the teaching space. If we want to expand that concept within the buildings: phase 3, phase 4, phase 5, this is, you can see, developed from the rotative square which you notice in art and architecture and you will notice we have developed a very strict, rigid study.

A young lady who is an unbelievably patient draftswoman is developing all of these; and incidentally, these are not buildings, they are just the subanalysis of the system. It is obvious that it is nonlinear; each of these four spaces has overlapping tendencies to borrow one from another. None of the forms have to be perfect, although they have to work in relation to a discipline. Here you can see them as they go from a packet--four to a pack of 16. Here we can see them in rows. Here we can see them in rows in another direction. Here we can see them as they become what we call order which is a composite of several systems. You will notice that there is a twisting--you can just imagine for a minute that larger center face as a force as a kind of classroom or lecture center cluster leading to other offices in architecture. You can see the very great variation within the same mold. We are not trying to find a way through a strait jacket and come out with another 3 x 5 study; we are trying to come up with a system which allows for a more complex change in addition to building over and beyond their initial purpose. If you notice, out of this a very rigid order exists--a very linear order, if possible. These were studies for location for mechanical systems, for secondary column structure systems, and problems in communication. These get involved with the thesis of lattice and the thesis of minimum or maximum surfaces touching. Then here is a lattice of a simple direct field as the lattice is faced with extensive diagonal. Then you can see this as a projection of a matrix of a very complex society in which you can come and build any portion of this at any one time and then you would add on to these knuckles. You know there are three basic studies going on in architecture these days--the plug-in theory which the English people propose, there is linear, and there is matrix. Our field in this is a series of studies in this area. Now you can see just by coloring certain elements, you can actually designate the distribution of discipline or order. You can look for patterns of expansion. You can develop different kinds of means of communication. You can change the field or pattern. You can begin to look at this as a topological environment in which these floors are not exactly at the same level and actually use the corridor as a means of moving space rather than down the desired corridor as one means of central communication to the other. In other words, if chemistry gets in its locale with instructional classrooms to be shared by others, how can this be located with better proximity to chemistry and still allowed to be located as part of the general distribution of a classroom throughout the whole campus. That's what these series of studies are, and here's another series of studies which obviously involve the helix as a form. These involve a different way of treating it, except going at it by object is to go at it by area.

These are studies on problems of changes of office size. One of the interesting comments we have gotten from the first phase of the U. of I., the professors say, "Do I have to have my office exactly like the next office?" How can we look and see for a variety of spaces, can we achieve different size offices in different areas? Most faculty members don't need or want the kind of office which is available for industry. They like to develop a subcorner for a work center as well as an area to talk to the students. There are opportunities to use additional room to a specific advantage. So these are simply abstract studies to develop for ourselves a vocabulary which will tie this vocabulary back into the strict programmatic vocabulary back into the total educational environment. Then we hope to come up with what we call a phase three for the Chicago Circle campus of the University of Illinois.

MIAMI-DADE JUNIOR COLLEGE: DESIGN OBJECTIVES AND THE ADMINISTRATION VIEWPOINT

DONALD C. BULAT

Most of you have a mental image of Miami. I would like to focus on that image with some personal observations. Sitting closely beside the assets of the "world's playground" and far outdistancing the lush growth of an imagined tropical paradise, there is a grim reality--the grim reality familiar to most American cities: strip development; too many signs; sprawls of cheap investments; insufficient mass transit and the surgery attendant with the extension of expressway systems. Forget for a moment, the rows of pleasure domes along the ocean front, the palm-lined shores, gulf stream fishing and the famous moon. Think of a million and a half people spread out thinly, on a vast flat grid which has grown too fast, because each year is mostly summer and enough people elsewhere desire less winter.

In spite of this "reality," I am, as are most Miamians, fiercely loyal. In our climate with proper nourishment and water, one can grow full-size shade trees in four years, and, in spite of such a climate, one can within four years observe the conception and partial delivery of two new junior college campuses boasting instant over-population. Let us ask ourselves some questions.

Have they been done too fast? Yes.
Must they have been done that fast? Yes.
Are the campuses good campuses? Very good.
Are they perfect? No.
Can they grow and change gracefully? Yes.
Will Miami one day be proud of them? Most emphatically, yes!

If you would like to know what sounds big and sudden to Miamians, in six years, since 1960 when Miami-Dade Junior College was begun, it has grown beyond reasonable proportions to 17,000 students and 600 faculty. In 1962, the general services administration gave to Dade County, a surplus marine air base, some 245 acres of treeless runways, in the northwest section of the county. Today, in 1966, we are $15 million toward an ultimate $20 million North Campus, designed to accommodate a student body of 10,000. The North Campus is the first of two major automobile expressway commuter colleges in the grand manner.

The South Campus is rising on the very margins of the Everglades in a seemingly isolated pine and palmetto land, but the isolation will be brief. Both campuses are attached to the expressway systems. South Campus' first phase buildings represent $6 million in structures and $2 million in site development. When complete, South Campus will also accommodate 10,000 students, as well as the central administration facilities of Miami-Dade Junior College.

A third campus is being considered for downtown Miami; current planning calls for a high-rise educational complex to be constructed as part of a space-creating downtown urban renewal project. Project enrollments for 1975 for all three locations are estimated at 25,000 to 30,000 students.

For a campus three-quarters complete, with construction constantly in progress, with a site as charmless as the Gobi Desert, the North Campus works superbly well. May I offer these observations:

(1) It is a good super-regional shopping center.

(2) Its six entrances serve a well-defined, well-lighted basic traffic system.

(3) Pedestrians know where to go for escape to the carless havens within and between the buildings.

(4) Drainage is positive and quick--with our sudden rain potential, it must be so.

(5) Loading and unloading under cover, as well as protected access between buildings, is provided by covered walks which are also self-lighted and self-draining.

(6) There are places for sitting and for groups to talk between classes.

(7) There are oases which get the wild refreshment problem away from the buildings.

(8) There are second-floor bridges between buildings to reduce vertical travel.

(9) Covered shaded transition spaces within the building are generous.

(10) Major stairs are kept open and are very pleasant to use.

(11) Interior spaces are flexible, at least as flexible as initial low budgets would allow.

(12) Spans are generous.

(13) Faculty offices are grouped for efficiency and are evolving into very efficient units as we build more of them.

(14) Pre-cast exteriors have the cardinal virtue of being maintenance free, and liberal use of exposed concrete in both interior and exterior spaces means little or no future maintenance requirements in these areas as well.

Now, conversely, what doesn't work?

A tight budget on the original building prevented the inclusion of necessary hurricane shutters for the openings of the concourse, and expensive water damage occurred during hurricane "Cleo" in 1964. The sophisticated air-conditioning system in the original building went through a "balancing program" for three years before finally being tamed.

Vital "as built" drawings were lost somewhere among the college, the school board, and the architects; recapturing that information has been troublesome.

Ramps were not always provided between level changes in buildings, making problems for the handicapped.

Professional analysis of the sub-soil conditions on South Campus did not anticipate the existence of underground cavities; an expensive, time-consuming program of pressure grouting is still being pursued.

This list, also, could go on and on, but most importantly, we are not forgetting the good qualities which we have created; and we are facing the problems which we have recognized as we find chances to do so.

Can you understand the public's response to the first great structure that appeared on the North Campus way back in 1963? Majestically uncompromising and four square, the first segment of a grand plan, it was inevitably criticized before other neighboring buildings could qualify it, and before carefully planned landscaping could help to soften it. Before receiving its proper name, Scott Hall, we called it Building "A," but unfeeling student observers suggested "A" stood for "Alcatraz." The sun struck with brutality at the bald open site, and that first great square building was an unhappy experience, but only for those who did not have the full dream in their minds. As to other newly completed structures, and there are two at this writing, landscaping, lighting, curbed roads, and young trees have begun to reveal a pattern which will place Scott Hall in perspective; now the North Campus is beginning to function as a small practical city with an aesthetic future.

What happened to lessons which we began to learn almost immediately from what was done on North Campus? There was constant re-evaluation with educators and architects. Tight, but realistic schedules were set up for the achievement of future buildings and educational specifications were shaped, studied, written and delivered in time to be of fundamental value to the architect. This educational philosophy was started early enough, so that all its authors could sign off on the specifications and later share in the responsibility and credit for the results. Existing troubles were fed back to the architects and through constant interaction, problems began to melt away. The architect had more time to provide for what was ultimately recognized as an honor award for South Campus design excellence.

Because of the astounding enrollment at North Campus and also because of the timing necessary to obtain state legislature approval of funds, the planning, programming and designing of South Campus was also a struggle against time. The South Campus master plan identified four broad areas of planning: namely, educational planning; urban planning; campus planning; and architectural planning. It was an exercise in planning at all levels using the fullest possible research and feed-back communications; PERT and CPM were written into the architect's specifications. There was a complete definition of philosophy, and the first order of business on South Campus was a funded master plan involving basic utility and communication possibilities. Every agency involved was introduced early, and the public relations were carefully managed so that Miami would know that a South Campus was coming.

In a few minutes, you will look upon the physical image of both campuses produced by our architects. "The old campus and the new," as it were--the two being a mere three years apart.

The firm of Pancoast, Ferendino, Grafton & Skeels needs some explaining, for it is not a typical architectural firm. When it was first involved with the junior college work six years ago, it was a small respected firm of approximately 10 persons. Shortly after the North Campus' Scott Hall was completed, the firm was named as consulting architects to the Dade County Board of Public Instruction, the first private firm to fill that role. Although restricted by their contract from all but an advisory role in secondary school facilities planning, the firm continued with its junior college work. Its staff now numbers over 60. Research is a part of its school board contract, and many seminars in school research have been held, several on subjects which have influenced the work for Miami-Dade Junior College: carpet research, soundproof doors, air-conditioning problems, divisible auditoriums, synthetic wall coatings, fluorescent lamp color uses, open stages, educational specifications, lighting, stage curtains, emergency lighting and science equipment. You can sense by this, then, that the firm is not a usual one, and that it is thoroughly involved with the junior college problem.

At the American Association of School Administrators' meeting in Atlantic City this year, many of the award-winning architectural exhibits carried in the identification section the credit "Architects, Engineers, Planners." The planning requirement is now being given visibility as a special service. Several weeks ago, the American Association of Junior Colleges' meeting in St. Louis devoted a full afternoon's program to the concept of planning junior college/community college facilities. Very shortly the Washington, D.C. headquarters staff will add a person who will have as a basic responsibility the requirement of assisting new junior or community college organizations, so that they may effectively plan for and bring into existence meaningful educational complexes that will respond to future philosophical and technical advances.

It is my personal belief that the typical educator, together with the typical architect, directed by the typical administrator, cannot in this day conceivably deliver adequate or meaningful, up-to-date college facilities. As central and essential as the educator is, we must hope that he is involved in the full-time job of education.

(1) The architect, no matter how aesthetically capable and practical, must be attached to an information system which will deliver to him incredible amounts of current information: he must be provided with a complete program or guess at the true nature and function of his buildings. The administration cannot divide its attention sufficiently nor possibly afford the time to identify completely with both educators' and architects' problems. There is a critical need, which I wish to underscore, for the element which I have sensed is missing from so many college-faculty-creating teams: it is what I call the educational planner: he is an anticipator, a coordinator, a trouble-shooter, an innovator, an evaluator, and a stimulator. The Renaissance concept that the architect can and will be all of these things is most dangerous to us in education today. The educational planner may be a part of the architect's team. He understands, but is not deeply immeshed in educational processes. He is more apt to be an important part of an enlightened college administration. It is the educational planner who must help educators, administrators and architects to meet the crushing, seemingly impossible requirements of providing adequate college facilities today.

MIAMI-DADE JUNIOR COLLEGE; THE ARCHITECT'S DESIGN OBJECTIVES

Lester C. Pancoast

As Donald Bulat states, Miami is a wonderful and unique place which shares the visual malfeasance of many American "almost-cities." It's a free country, people can build exactly what they wish; and they are free to have no common ideas in the matter. Architecturally, we have no common denominator except bright, painted stucco; the white, shining city is beautiful only from the air. There is no basic regional vernacular, and there are no background forms. Every little store along the street can dazzle the automobile driver with a brilliant sign. Every bank can shake and shimmer with its anodized devices which pretend to control the sun and usually do not. Poorly painted schools, sprawled out upon generous sites, have only recently been given to air conditioning but still not to quality budgets, nor to designed landscape. Most of them are flat boxes of great length with ventilator bumps atop. Each year's newest hotel glories in upstaging its neighbor. Schmaltz tarnishes. Where seized at all, each new design opportunity is seized as a license for experiment and self-satisfaction. We love to grow too fast, but not too well. Our University of Miami's ambitious buildings show the prima donna complex of some of our best architects: each successive building statement rejects whatever quality occurred in the one before. The atmosphere is bright. Most of the time people squint; windows are shut against reflective light. Areas between buildings are not designed, and the space flows away. It is serious. It is difficult to promote to people seeking quality. It is difficult to love. But it is very alive! Stand back and watch it increase.

Not many architects get a chance to conceive a little city within a city, much less two of them. Our design objectives are in a large measure our response to the outside city around the campuses, and these objectives have held true in essence if not in method of expression for both campuses. We have been most anxious to achieve an architectural sense of place which we experience so seldom in Miami. We have drawn our wagons in defensive circles against the attacking enemy, the automobile. We have worked to attach to future expressways, and have provided many entrances and four-lane arteries to pump in and out, and we achieve the glorious-horrible sight of several thousand heat-soaked, sun-struck automobiles around us, sparkling, multi-colored, and gross.

Our construction desperately needs strength and a monumentality in order to survive those cars. We are conceiving super-regional, non-commercial shopping centers. From heavily traveled, strip developed, four-lane 27th Avenue, North Campus cars are hidden from view by a great rolling berm planted with Banyan trees. Trees are placed among the cars also, and within a year or two will go a long way toward humanizing those vast asphalt spaces. The building of a simple parking lot is a complete science and no place to save money. We must collect people from their machines and say clearly, this way! And then we must not make paths which pretend that people will take the safe longer sides of the triangle when there is a dangerous hypotenuse available. We have learned to walk among monsters. Scott Hall's three-story entrances can be easily seen from the furthest edge of the furthest parking area, which is no more than a five-minute walk away.

Our covered walks which connect all buildings also reach the edges of the nearest parking areas effecting many feet of covered loading space. Miami has between 60 and 100 inches of rain each year, and most of it thunders down abruptly in warm floods, but the canopies are used whether it rains or not.

They are man-made trees cast on the site, self-drained and self-lighted. They are low to the head, and as intimate as precast umbrellas can be. They also vary the visual experience of approaching a building by preventing it from being revealed all at one time.

The canopies are the beginning of the transformation of the hot sun-baked pedestrian into a cool, dry, efficient indoor animal ready to face the explosion of knowledge. From beneath the low canopy which reaches into a building, he enters a high interior sky-lighted non-air conditioned, but well-ventilated concourse or central space from which air-conditioned corridors lead to classrooms, lecture halls or laboratories. Once he is there, he has little or no chance to look outdoors. The argument of whether or not it is moral to enclose youth within spaces without windows still continues in our state. My firm contends that the problem of claustrophobia in classrooms is a function of time and concentration of attention. And it has resisted the situation of interior spaces with cheerful colors and clear-stories above partitions. Exterior rooms in our junior college buildings have sometimes been supplied with narrow slit windows for simple reference to daylight and height. Faculty offices and non-classroom experiences have, with rare exception, been supplied with near-by glass and the glass protected from the sun.

Although supplied with educational specifications and high-quality building programs, we have been certain that space-uses will change as surely as education changes. This has meant a careful balance between flexibility and architectural specifics. While we necessarily have rejected many expensive devices for easy flexibility, the question of the future was constantly in mind and determined much of the character of these buildings and their spaces.

We were early determined that these buildings should look strong and wear good clothes. The bones of our first building were concrete: rough, sometimes blotchy, contrasted with darker rich-warm grey, highly articulated precast panels. White glass mosaic stair towers were to stand out before these darker materials. Our rationale was heard and accepted before construction, but our public is given to habit and propriety which only time and thought can reverse. Our materials were much scorned. The second building at the North Campus deserted the grey precast, but the third one was allowed to return to it. The equations of good design are delicately balanced. As the North Campus and now the South Campus proceed and one finds it on all hands, the unfamiliarity with concrete is disappearing as well as the comment, "When are you going to paint it?" We are learning to present concrete better. We have learned to call it textured concrete, to endow it with greater texture, and to expose its aggregate. The grey precast walls of the darker buildings are beginning to recede, as they do on so many campuses, behind green trees and hoards of ruddy, colorful, non-squinting students. The precast being used on South Campus is faced with a rough native stone in good contrast with the concrete structure, possessing immediate appeal, and an inevitable softening as it ages.

I have touched on the basic planning, the interior spaces and the structures themselves, but the spaces between and surrounded by the structures hold a critical difference between achieving a bunch of buildings which happen to be near each other and a special place through which one moves and to which one belongs. The lake at the North Campus, the sale of sand fill from which netted the general services administration $17,000, was a bold effort to bring regional identity and site amenity to a very hot and dry desert. The interior experience of the college, when the trees become large and shade-providing, will be that of a hugh cloister, at least psychologically cool. Before long, a bridge will be built across the lake and the campus will achieve its major, and we predict, its most popular focal point.

In an effort to tie together new and existing buildings on the North Campus without their compromising one another, we created a transitional space described by forests of what we call Australian pines, and criss-crossed it with diagonal walks in every direction the student might wish to walk. To our own surprise, it resembled closely in plan the great diagonal runway pattern which we have now nearly obliterated from our 245 acres of World War II airport. At this date, it looks like 50 straggly coconut palms (regional identity) and a reforestation project of spindly pines, but it will, we explain, mature into a fine green space which has been named "The Prado."

The South Campus is only half-born. Its interior spaces will be far more urban in their impact than those of the North Campus just described. If there was not already within us a desire for well-designed contained city spaces, the splendid Cuban architects Mr. Castro made available to our firm have certainly brought with them their love and nostalgia for their native plazas, Defined by three initial structures and by covered walks, the entrance plaza of the South Campus will receive the action of the main entrance, and serve as an atrium. The level of this plaza is to be raised above the automobile's approach to it. In a country as flat as ours, slight level changes can cause excitement. Large live oak trees will be planted in depressed sitting wells which are as patterned, as fixed, and as formal as the buildings themselves.

A larger academic plaza, however, will be at a lower level than its surrounding buildings, and it will serve as the main focus for student attention. Although trees will occur in the academic plaza also, the major space will be opened for student signs, confabs, and expressions: a city square susceptible to rearrangement for special events.

Massive and sensitive architecture responding to regional needs and possibilities: one campus a family of rectangular buildings surrounding a rectangular lake; the other a small city of interconnected geometric masses and urban plazas, all purposely restrained in a harsh era! Do our designs deserve such lyric description? Parents can talk endlessly about their children. If you were to visit the two sites now, you might suffer an anti-climax after what I have said. But in this faster moving world, it still takes a few years to complete the visions, and a few more to fully assess the true values of one's design objectives.

SCARBOROUGH COLLEGE

John Andrews

The academic program of Scarborough College is unquestionably one of this day and age and is directed toward contemporary teaching techniques such as the closed circuit television installation, one of the most extensive installations of this type in North America.

It is obvious that a forward-thinking program such as this could not best be served by established design concepts based on traditional teaching philosophy. In fact, the closed circuit television system became a very basic determinant of the size of most teaching spaces and, of course, of how teaching is carried out in these spaces.

A rational evaluation of the problem indicated some very fundamental determinants which, once recognized as basic design parameters, had a profoundly formulative influence on the buildings now in existence as Scarborough College.

The determinant of growth, where there was a beginning stage of 1,500 students, a ratio of staff to students, an amount of space for both staff and students, but no real knowledge of where this would end, has largely resulted in the sections shown for Science and Humanities, where an incremental expansion longitudinally provides the correct relationships, areas and numbers of people in any stage.

Beginning as they did at the center and growing away from it, these basic teaching buildings of Science and Humanities were able to expand away from the completed teaching areas and the interruption of teaching by further construction will consequently be at a minimum.

The site itself, another fundamental determinant, is an unusual one for the Toronto area, both geologically and ecologically. The vast amount of original tree growth was something to be used rather than eliminated. The sharply defined edges of the valley were used in a resourceful manner, and are largely instrumental in the totally walk-up buildings that resulted where, backs to the slope, one enters at a mid-point in the height of the building.

The extremes of climate during the academic year make it quite necessary to reject the established college concept of scattered buildings, where the university is complete only when the last building is added, and no recognition of the extremes of climate and the subsequent inconvenience are expressed in the concept of individual buildings. Subsequently, the climate controlled pedestrian access systems became the arteries of Scarborough College, or more correctly, the streets, and it is along these streets that all the activities making up Scarborough College are clustered.

(Presentation and description of slides followed)

SIMON FRASER - A UNIVERSITY IS FOUNDED IN BRITISH COLUMBIA

Arthur Erickson

The Competition

The government of British Columbia announced a competition for a new provincial university in May, 1963. The site for the University was chosen from a number of sites by Dr. Gordon Shrum, on a 1300 ft. rise of land, Burnaby Mountain, which dropped directly into the sea of Burrard Inlet on the north, and gently down to the town of Burnaby on the south. Though physically remote from concentrations of population, Dr. Shrum speculated on its generating its own population, and on requiring, above all, space to expand.

Sociologically questionable because of its isolation, the site has, however, redeeming factors. It surveys the urban centers from its lofty position; one is always conscious from every part of the university of both the natural and man-made environment. Thus, there is a very real relationship between the university and the city, very much in the tradition of the first universities, which in themselves were retreats. It also provides a very stimulating experience for every student who climbs from his mundane surroundings to the mountain which, in altitude, climate, architecture and community, is unique and elevating.

The competition program clearly suggested five buildings or building complexes, each of which was eventually to be awarded to one of the five winning architects. We realized that in order to achieve what we felt was possible in a university complex, we would have to forego our chances of winning in order to present the ideas which we felt were valid. The single building complex offered not only very necessary protection from the weather, but far more important, the opportunity to create spaces which we felt were as pertinent to the students' university experience as the classrooms themselves. The competition ran for three months. The judges recommended that the four other winning architects be asked to work on our plan and that we be made architect/planners and coordinators of the first phase of Simon Fraser University.

The Concept

The concept of Simon Fraser University derives more from a basic approach to education, to human relationships at a university and to the university's role in the culture at large, than from a particular aesthetic approach. This latter is least important when considering what a university really means to the mid-20th century community. The issue, then, is to redefine the university in contemporary terms, to make it meaningful to the community and natural to the place where it sits.

We precluded that a great institution for the cultivation of the human mind and spirit should provide an environment that strongly evinces its intentions; such was the case in the colleges of Oxford and Cambridge for the mind of the Middle Ages. They were so effective, in fact, that they became archetypes, and colleges even today follow that pattern because it reflects a philosophy about the learning process that in many ways is still valid. Such was the case in the Islamic University of El Azhar in Cairo, a different but equally moving approach to their cultural heritage. Similar were the Academies of Greece, where we are told of a famous wall in Athens or a collonade on the mountaintop of Pergamon to stroll around for discussion's sake.

But the North American campus has grown up in the era of specialized knowledge--and reflects the mechanistic departmentalization of contemporary attitudes. Both faculty and students are Chauvinistic guardians of their intellectual precincts, and campus buildings are fortresses against rival intrusions. Such open campuses, studded with the representative buildings of the various disciplines, must surely negate a profound attitude towards the total body of knowledge.

Today the expanding boundaries of knowledge cannot be traditionally confined--a university campus must not only encourage exchange, but allow overlapping and even merging of the various disciplines. Then the university can begin to present an image of universality. It can demonstrate the interrelationship and interdependence of all aspects of the human culture that produced it.

The idea of universality and inter-relationship was fundamental to our concept for Simon Fraser. It was less important to show that Chemistry or Mathematics or Theatre or History were taught there than that knowledge in its infinite complexity was represented there for the advantage of the community.

The priority of the different disciplines was then subjected to the logic of the human path. The movement of many numbers of people from a point of entrance to the classrooms dictated a simple skeleton of walkways that would lead easily to each part of the university in a meaningful sequence.

To change the emphasis in the plan from the individual buildings to the human path, it was necessary first to break down these traditional buildings into their component classrooms, laboratories, offices, service spaces and corridors, then to use these components as building blocks to shape the new environment. Thus, the spaces where the students would walk or gather; the corridor, the meeting place, the street, the plaza, the collonade, the stairs--all elements of the experience of walking--became the device for creating a meaningful environment for the formative mind. The experience of the classroom was complemented by the equally important experience of the after-class contact with one's fellows.

We observed that walking, from the palestras of Classical Greece, the gardens of Buddhist temples, or the cloisters of Christian monasteries, has provided both aesthetic pleasure and intellectual stimulation. The walking sequence through the university from arrival to classrooms was planned to be an uplifting one, the architecture unfolding with one's progression, providing spaces for the activities that are necessary for the full enjoyment of campus life. From the central arrival point, the Transportation Center, one ascends to the Mall and then up to the summit crowned by the Academic Quadrangle. The Quadrangle encloses one of the major spaces of the campus--a tranquil enclosed square uninterrupted by any arresting form or view--a space designed to walk around and look into--a strolling area intended for the scholar--an area that has been traditional to most places of learning in the major cultures of East and West.

We took advantage of the extraordinary beauty of the site by placing the Academic Complex at the highest point and bridging the lower points with a pedestrian mall that serves, as well, the very practical purposes of containing the main services for the University as well as parking decks. The Mall is a kind of aerial campus providing a most evocative outlook from every part to the juxtaposition of human habitation with the natural setting far below. The heart of the Mall, the principal meeting place, outside the library, is covered by a glass roof for year-round protection. A place for the interchange between young and enthusiastic minds was considered by us to be one of the most important and most often neglected provisions of a university.

Thus, the usually scattered university campus was compressed in a single campus building within which one can clearly discern an academic area with labs and classrooms gathered around the Academic Quadrangle; a cultural area at the Covered Mall between the library and the theatres, an Entrance at the Transportation Center, with the coffee shop and student services offices; a recreation area, now comprising only the gym but in the future the student union incorporated into the extension of the mall adjacent to the gym; and a residential area, now only the Women's Residence but in the future a complex of residences joined to the Mall. The linking of the Mall to all parts of the campus provides not only the necessary services link but uninterrupted covered walks as well.

This latter, a continuous shelter throughout the campus, is indispensable in the relatively mild but very wet climate of the Pacific Northwest. Weatherwise, cold is a hardship that merely tests human survival, whereas rain has all the discomfort and humiliation of being dunked or having water thrown in one's face. Scarborough is an admirable response to the severe climate of the East which requires air-conditioning for all but very brief periods of the year, and thus its student spaces are internal with only secondary use of the outside. Simon Fraser is the reverse: its principal spaces are external with only secondary emphasis on the inside. The main devices of weather protection, the covered walks and canopies, are not appendages to the buildings but a very integral part of the buildings themselves.

Finally, the concept took into consideration an aspect of the modern university which is perhaps the most critical of campus planning. This is expansion. In the typical American campus, expansion occurs much in the same way as suggested in a highly organized fashion in the plans for the Friei Universitat of Berlin--that is, from various nuclei distributed on a campus grid into the intermediate spaces. Universities everywhere are filling up these intermediate spaces between buildings and at great cost to the disturbance of lectures by continuous disruption of the University core. Expansion can occur upwards, into, along and outwards. It seemed to us that, if possible, a precinct should be established which would not be interrupted by continuous building, and that continuous building should occur on the fringe--expansion, in other words, by accretion. For this reason, the areas that required constant and continual expansion were placed at the extremities--labs, offices, and classrooms at one end, residences at the other. In the precinct was the theatre which would be added to only once and in ten years, and the library which was overbuilt to allow for a five-ten year expansion and then would be expanded vertically.

The two and three-story nature of the classroom, lab and residence blocks, meant that they could be expanded in very small increments in a continuous building program tailored to actual needs. They would expand down the hill into parking terraces which themselves would occupy the cleared and graded foundation for the next increment of buildings. Ready access from parking directly into the classroom or lab block would be through internal corridor or external street--a medieval street wandering down the mountainside between the building sections.

In breaking the traditional department building into various units and reassembling the large building mass from these into an architectural form which achieved the initial goals, laboratory spaces were collected together, simply because of the high cost of services and different use of the space than in the classrooms. The classrooms, which range from large 500-seat to seminar rooms, were placed on both sides of the Academic Quadrangle; with the smaller classroom units without fixed seating and planned for seminars, expanding to the north; and the laboratories, requiring larger accretions of space, expanding to the south. There was also a question of lighting in this separation because the original intention was that the laboratory space, which was basically work space, would have no windows but artificial light would be complemented by skylight washing down the walls; whereas the more informal and relaxed atmosphere of the classroom could enjoy windows viewing to the north.

The staff offices ended up crowning the whole complex, but the intention was not a hierarchical one, but that these being the smallest spaces would be gathered in a special block along with the smaller seminar rooms. The academic policy now is to hold large lectures of 500-600 students in the Science Complex, with accompanying seminars for small groups in the Academic Quadrangle. The former Academic Planner, Ronald Baker, has expressed his views that ideally the best possible lecturers in their fields would give weekly or even monthly lectures to 500-1,000 students; and that their academic responsibilities would thus give them more time to pursue their own excellence in their various fields. Really top people are scarce, and this justifies, I think, the large lecture under the pressures of university attendance. Also the policy at Simon Fraser, and certainly this was our original feeling, is that students should be left much more on their own; there should be a greater reliance on the library and their own research, with direction and stimulation given in the large lecture and guidance in the seminar. As a matter of fact, we were amazed at how the academic program developed in complete accordance with our initial thoughts about the university.

The architectural form given to the Simon Fraser University "plan" was an interpretation of the ideas inherent in the concept as well as the consideration of the most appropriate form for the site. It seemed presumptuous to put towers on a mountaintop. To build horizontally close to the contours seemed not only more fitting but more practical because it allows for easy inexpensive expansion. Parking lots and playing fields had to be cut into the site as terraces, and the buildings were allowed to follow the contours on terraces as well so that the "terrace" became the predominant formal idea of the University. This way of building on hilltops effects a most harmonious relationship between building and contour, allowing the university not just to sit on the mountaintop but to become part of it and extend quite naturally and easily down the slopes.

This guiding principle determined how buildings were to be massed against the east-west axis of the mall. The mall had been sighted on the First Narrows Bridge to the west and the fertile valley of the Fraser River to the east, directly on the campus coordinates. Horizontal masses dominated the composition with verticals providing deep recesses at the windows, so that the more durable character of conrete rather than glass reads as the dominant material. The combination of horizontal masses with vertical accents provides pleasing but insistent rhythm throughout the building masses and is reflected even in the trusswork of the glass roof. Such a simple thematic device, which serves structural purposes as well, gives the building complex its characteristic of repose.

Concrete, unfinished, cleaned by sandblast or bush-hammering, is the basic structural and finishing material and is consistent, pervasive, and unadorned. The floors, which should be more like a carpet, are of clay tile of various tones. Color was to be used intensively only in the interiors, where it is appropriate and does not disturb the harmony of the composition of masses.

The surrounding landscape was to be as uncompromising as possible. Field grass, unrelieved by other planting was to be brought up to the base of the buildings--the surrounding forests cleared far enough down the mountain to give the sense of a tree belt stopping at a tree line above which the open meadows of the summit extended. Planting of shrubs would occur only within the concrete confines of the university itself, and these could be consistent with the austere character of the mountaintop. The only elaborate "landscape," as such, is inside the quadrangle which is designed as a counterfoil to the purposely monotonous facade of the quadrangle as a walk-around landscape providing a constantly and dramatically changing composition to the viewer.

The Sequence

At the university transportation center, one arrives on a platform two stories below the main mall level. The transition to the mall level is first up under the lantern--one is drawn up to the light, so to speak--which is the central point of the university; to one side is the academic zone, to the other is the recreational and residential zone.

In order to accomplish the difficult transition of a two-story flight of steps, the steps are made as wide as possible and the view at the top as intriguing as possible--to the residential side, up to the small courtyard of a soon-to-be-built cafeteria--on the academic side, a view of the fountain before the space frame of the great covered mall. The intermediate level leads off to the coffee shop, post office, bank and shops level, which will eventually tie into the student union. Above and around the lantern is a student lounge, the central offices and committee rooms of the student council.

The long space of the mall was divided into areas differing in character: the arrival court, the covered mall and the court below the quadrangle. The arrival court is a small sunny landscaped forecourt to the covered mall which opens like a great marketplace beyond. The covered mall is the heart of the university--the meeting place in front of the library, the theatres and the coffee shop, for the mingling of the university body as a whole, its galleries, stages and stairways acting as a kind of perpetual theatre of the university populace--conceived as a meeting place, an assembly hall, a ballroom, a theatre--to serve a multiplicity of activities as its possibilities are discovered by a creative student body. The glass-covered space frame roof provides the umbrella against the rain but lets the sunshine pour in.

The progression through the mall reveals gradually the high flight of steps leading up to the circle of the Academic Quadrangle at the end of the mall.

The small court below is another kind of space hunched between the grand stairway and the stage.

The quadrangle, in contrast to the mall, which in its composition is a passageway--a bridge--and emphasizes movement and direction, is static. It is square in plan and undifferentiated in its facade to act in as static and quiet a way as possible--and thus represent arrival. Looking up the steps, it encircles the sky; only on arrival is the quiet of the garden apparent. It is the center of the whole academic complex; it is at the top of the composition of the university buildings, and in a sense represents the tranquility of achievement after intellectual pursuit. The edge of the quadrangle platform is where one turns to look out.

The only other significant spaces of the university as built spill down from the academic quad--they are the small intimate and chaotic mediterranean streets--pinched between the labs and lecture rooms that terrace down the hill. This is left-over space from the encroachment of academic facilities and thus takes advantage of its haphazardness. At any stage of the university growth, we can enter the university at the bottom of these streets, climbing up the terraces and entering periodically under the lounges which bridge across, joining the various lab and lecture blocks.

In the future, the west end of the mall will have a different but equally impressive resolution of its spaces. The residences will open out from the mall surrounding an open-ended quadrangle that is exposed to the westerly view of the city of Vancouver. The rising and the setting of the sun fall along the axis of the mall--drawing one in the morning to the east and in the evening to the west terraces formed by the residences.

Thus Simon Fraser was designed as a composition of external spaces, and in this it is perhaps distinct. Since the buildings were for the most part disintegrated to begin with, they could be reshuffled and arranged as building blocks to compose a kind of landscape--if we call, for the moment, external space, landscape. What occurs then, is that no building has an independent identity. Its important rests entirely in its role as part of the over-all composition, from which it cannot be separated or stand alone. It is a medieval situation insofar as buildings cannot be read for themselves. Since we were only half-conscious of this situation at the time, it was not as successful as if we were to do it again. And the way it happened, which I will describe, didn't allow complete realization of its possibilities.

The Mall

Our office in the early months of the project was divided into personnel handling each separate project--one developing and overseeing the design of the university, and a team working solely on the site-planning and site-work--since clearing and grading were to commence immediately. It was not until this initial flurry was over that we got down to the design of our own building.

By this time, the final design of the other buildings had been established--the central mall, our particular project, was a kind of infill which we were reluctant to take except that its importance as the link--the service, traffic and aesthetic link between all other buildings--was indisputable.

We were designing not a building but an interbuilding--a bridge that was a gateway, a parking structure, the initial part of a student center, a transportation center, an information center and central services core and the main pathway to all the buildings. We had so many balls in the air that the only recourse seemed to be at times to shut one's eyes to see where they would land all by themselves.

But it proved to be a far more important project for our own enlightenment than we could ever have imagined. It pointed the way very directly to the future. By intuition, by luck or by accident, we stumbled onto this marvelous area of non-building--and it was like coming back to the source of architectural form. So rich was this, in fact, that we can no longer see the single building as much of a contribution to the environment. We see a way out of the Renaissance mode of thinking that plagues our cities and most of contemporary architecture. Le Corbusier, Mies and Wright belong to the Renaissance inasmuch as cubism can be considered as an extension of the Renaissance concern for the mastery of observable matter. However rich a language, each in his turn developed for the device and expression of human habitation, his main concern was introverted and particularized to the single building. Even their city plans were collections of single buildings--set in space in a most Renaissance way.

This particularization has been our problem. It accounts for the dilemma that has been at the bottom of all discussion of our cities. Our concern has been the bringing together of single separate buildings. Our culture has not yet been able to perceive in a medieval manner. The concept of particularization--that is, individuality--either of a person, a building, or a part of something--has inhibited our ability to see the whole, except in a mechanistic manner. We see our universe not in terms of meaning--that is in humanistic or religious terms--but in terms of performance. Nature is only a vastly subtler machine, and our conviction of this is exemplified by our reproduction of natural phenomena artificially. We see differences and the interaction of different parts. But I think a great change is beginning to occur; we are slowly becoming conscious of similarities and in seeing similarities, the differences that plague us now between architect, engineer, artist, decorator, builder, and client, etc., will lose their definition. It is the beginning of the end of definitions and the end of the beginning of architecture.